

ARTHROPOD FAUNA OF THE UAE

VOLUME 4



PATRON:
H.H. SHEIKH TAHOON BIN ZAYED AL NAHYAN

EDITOR:
ANTONIUS VAN HARTEN





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VOLUME 4

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H.H. SHEIKH TAHNOON BIN ZAYED AL NAHYAN

EDITOR:

ANTONIUS VAN HARTEN

Antonius van Harten
UAE Insect Project
P.O. Box 63799
Sharjah
United Arab Emirates
(tonyvanharten@gmail.com)

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The chapters have been arranged in a phylogenetic order, according to H.H. Dathe (ed.), *Lehrbuch der Speziellen Zoologie, Band 1 : Wirbellose Tiere, 5. Teil : Insecta*, Spektrum Akademischer Verlag, Heidelberg – Berlin, 961 pp. Korrigierter Nachdruck 2005.



PREFACE

2010 was the United Nations' Year of Biodiversity. Roughly 1.8 million species of organisms have been described to date, which may represent less than 10% of true species diversity. Arthropods comprise the largest proportion of described species. More than half of all species of living things (microbes, plants, and animals) are likely to be arthropods.

Currently, we are witnessing exciting times in which morphology-based taxonomy is being melded with DNA taxonomy. Soon, taxonomy will have fully transformed into a multidisciplinary science that delimits species on the basis of molecular, morphological, phylogenetic and biological evidence. Entomologists and taxonomists will have the tools to speed the discovery of the true wealth of the overwhelming behavioural, biological and ecological diversity of arthropods.

Documenting and cataloguing biodiversity is not an end in itself nor is it synonymous with conserving biodiversity. However, generating an inventory of species and gathering detailed information on them makes possible advocacy, education and communication on the soundest of foundations.

This Volume 4 of Arthropod Fauna of the UAE adds to our knowledge of the biodiversity prevalent in the United Arab Emirates.

H.H. Sheikh Tahnoon Bin Zayed Al Nahyan

Abu Dhabi, March 30, 2011



H.H. Sheikh Khalifa Bin Zayed Al Nahyan
President of the United Arab Emirates



H.H. Sheikh Mohammad Bin Zayed Al Nahyan

Abu Dhabi Crown Prince and Deputy Supreme Commander of the U.A.E. Armed Forces

INTRODUCTION

Volume 3 of 'Arthropod fauna of the UAE' was published on 31st of March 2010 and Volume 4 is following just over one year later. Chapters have been elaborated by 57 specialists from 18 countries. Of the 57 families dealt with in the fourth volume, 29 had not before been recorded from the UAE. Three new genera and 90 new species new to science are described from the UAE. In total 469 species are added to those already known in the country.

During the winter and spring of 2009/2010, six specialists came to Sharjah to collect material of their own groups, viz. Dr. Manfred Jäch, Natural History Museum, Vienna, Austria (Plate 1); Dr. Wayne Mathis, National Natural History Museum, Washington, U.S.A. (Plate 2); Prof. Tadeusz Zatwarnicki, Opolski University, Opole, Poland (Plate 3); Dr. Filippo Buzzetti, Arzignano, Italy; Michael Wilson, National Museum of Wales, Cardiff, U.K.; Dr. Vladimir Gnezdilov, Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia. Dr. Andreas Stark of Halle, Germany, came to assist with the printing of volume 4 and used the opportunity to do some further collecting.

Of the 30 project visitors that came to the UAE to collect arthropods during the period February 2005 to April 2010, 19 have already contributed to the first four volumes of 'Arthropod fauna of the UAE'. A least seven of the others are known to be in the last stages of completing their manuscripts.

Two new species published in Volume 3 named after the UAE's first mountain protected area, Wadi Wurayah, *Ochthebius wurayah* Jäch & Delgado, a tiny aquatic beetle, and *Nanomutilla wurayahensis* Lelej, a wasp species also known as a "velvet ant", received considerable press coverage in 2010 and helped to draw attention to that unique place.

The coordinates of all collecting localities in the UAE are given at the end of this volume.

I am very grateful to H. H. Sheikh Tahnoon Bin Zayed Al Nahyan for his continuous sponsoring of the project. The project and the published volumes have received worldwide recognition and will set a standard for biodiversity projects in arid areas for many years to come.

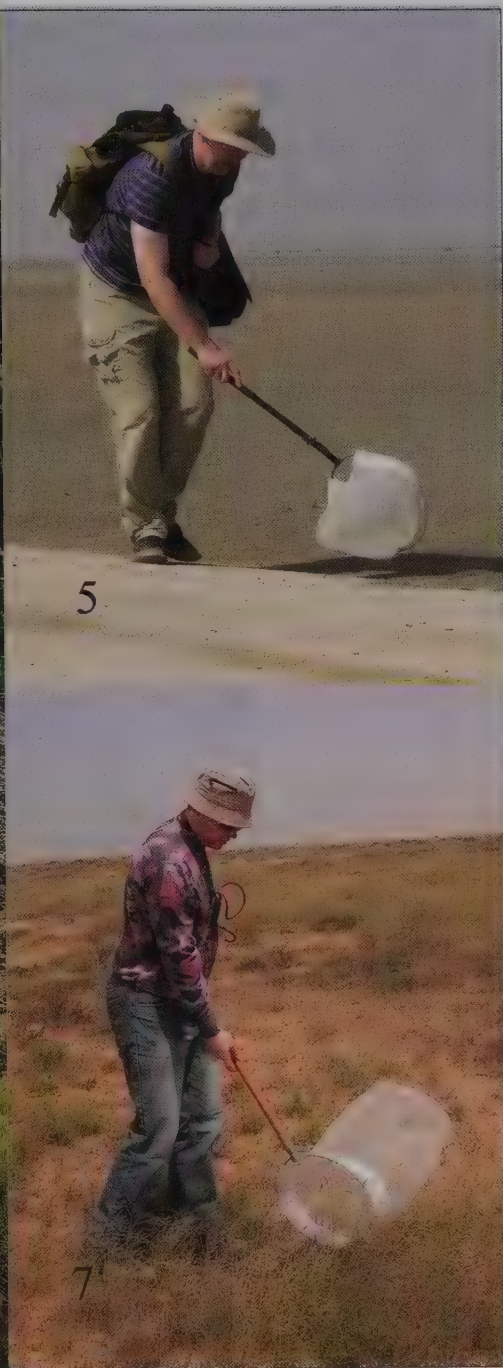
Special thanks are again due to John Deeming, National Museum of Wales, Cardiff, UK, for sorting many fly samples into families and for correcting the English of this volume. John suffered an accident late in 2010, but continued to work for the project from his hospital bed. Andreas Stark, Halle, Germany, as in other years assisted very significantly with the preparation of the illustrations of this volume. Without his tireless assistance the volume would have looked much worse. Photographs for the cover of Volume 4 were made available by Vladimir Korshunov (al-Ain, UAE) and Martin Hauser (Sacramento, USA).

Vladimir Kononenko, Vladivostok, Russia, again processed many photographs of Hymenoptera. James Turner, Cardiff, UK, made several brilliant photographs of flies and plant hoppers. As he left the National Museum of Wales late in 2010, his collaboration will be sorely missed in the future. Kees van Achterberg, Netherlands Centre for Biodiversity Naturalis, Leiden, Netherlands, facilitated for the editor to use the microscopic photography



Plates 1-3. 1: Manfred Jaech; 2: Wayne Mathis; 3: Tadeusz Zatwarnicki.

equipment in his laboratory. Within the UAE, Vladimir Korshunov (Endangered Wildlife Breeding & Conservation Centre, al-Ain) has been of great help assisting with collecting activities in the al-Ain area. The assistance of Paul Vercammen, Operations Manager,



Plates 4-7. 4: Filippo Buzzetti; 5: Andreas Stark; 6: Michael Wilson; 7: Vladimir Gnezdilov.

Breeding Centre for Endangered Arabian Wildlife, Sharjah, must also be acknowledged. As in other years, Khalid Mahmood competently operated the trapping network and accompanied the visiting specialists.

Mr. Saje Thomas, Managing Director of the Royal Group, Abu Dhabi, acting as the contact person to the project for the seventh year, as always took a high personal interest in its progress and tried to solve whatever problem that occurred. His Secretary, Mrs. Sunita Gomes, and Accountant, Mrs. Prarthana Devaiah, very capably covered the administrative and financial aspects of the project.

The excellent printing of all volumes by Dar Al Ummah Printing Publishing & Distribution, Abu Dhabi, greatly contributed to the success of the book series, in the UAE as well as abroad. The whole staff, especially the General Manager Mr. Benchamin K. Roy, the Head of Costumer Service & Prepress Mr. Veera Kalbandi, and the Art Director Mr. Muhammed Arif Salam, always were responsive to all requests made to them. The long experience of Andreas Stark with the printing of entomological books and magazines certainly contributed to the fact that the quality of the colour plates in Volume 3 was even better than in the preceding volumes.



Michael Fibiger at work at the laboratory in Sharjah.

After a prolonged illness, Mr. Michael Fibiger passed away on February 16, 2011 in Denmark. He was a great explorer of the moth fauna of the World, having published and edited innumerable books on the Noctuoidea. Michael visited the UAE Insect Project to collect during three weeks in the spring of 2006. From the material he and others then collected, an extraordinary beautiful chapter of 181 pages was published in Volume 2 of 'Arthropod fauna of the UAE' (M. Fibiger & A. Legrain: Order Lepidoptera, superfamily Noctuoidea, pp. 480-660). I dedicate this volume to the memory of Michael Fibiger.

Order Araneae, family Zodariidae

Rudy Jocqué

INTRODUCTION

This paper deals with the first collection of zodariid spiders from the United Arab Emirates. The vast majority of the spiders of that family are soil dwelling and many of them are obligatory ant feeders. They therefore tend to be among the commonest spiders in arid and semiarid habitats and are usually abundant in pitfall trap catches. However, considering the collection effort and the fact that pitfall traps were frequently used, the present collection is not particularly rich. This might indicate that the density of the populations of Zodariidae is very low.

MATERIALS AND METHODS

Spiders were studied and drawn with a WILD M10 stereomicroscope. Habitus photographs were taken with a Leica MZ16 stereomicroscope and the LAS automontage software. Scanning electron Micrographs were obtained with a JEOL 6400LV scanning electron microscope. Abbreviations in the descriptions are standard for spider taxonomy. All measurements are in millimeter. All specimens are deposited in the collection of the Royal Museum for Central Africa, Tervuren, Belgium.

SYSTEMATIC ACCOUNT

Dusmadiores deserticola Jocqué **nov. spec.**

Plates 1–3, 16; Figures 1–2

Specimens examined: Holotype: ♀, United Arab Emirates, Sharjah Desert Park, 25°21'N 55°24'E, 11–17.x.2004, at light, leg. A van Harten (MRAC 233877).

Diagnosis: The female of this species is recognized by the semicircular darker area with pale centre in the middle in front of the posterior margin of the epigyne.

Description: Female (holotype). Total length 1.92, carapace 0.92 long and 0.72 wide; P+TI: 0.76. Colour as in Plates 1–3. Carapace medium brown with darker radiating striae and butterfly-shaped pattern in front of fovea; clypeus suffused with black; chelicerae medium brown; legs brownish orange; sternum yellow with dark rim; abdomen dorsum dark sepia mottled with white and pale pattern of a pair of spots in the middle followed by three chevrons; sides and venter pale; spinnerets and anal tubercle pale. Carapace (Plates 1–2) with a few dispersed bristles. Eyes, AME 0.08, ALE 0.07, PME 0.07, PLE 0.06. AME-AME 0.03, AME-ALE 0.02; PME-PME 0.08, PME-PLE 0.02; MOQ: AW 0.88 PW, AW 1.09 × L. Clypeus 0.16, with few bristles. Chelicerae 0.30 long, 0.21 wide, without intercheliceral triangle, with very short, thick fang. Sternum 0.59 long, 0.59 wide; smooth, with dispersed setae. Legs, spineless, with femoral organ composed of two grooved setae. Abdomen, oval; membranous; setae in front of tracheal spiracle not modified. Epigyne as in Plate 16 and Figures 1–2. A fairly large darkened area occupying entire area in front of epigastric fold. Posterior margin broadly sclerotised with semicircular darker area in the middle; spermathecae widely separated.

Male unknown.

Remarks: Only three species are so far described in the genus *Dusmadiores* Jocqué, 1987. They all live in humid areas in West Africa, but it is assumed that many more species will be



Plates 1–5. 1–3. *Dismadiorea deserticola* nov. spec., female holotype. 1: Habitus, dorsal view; 2: Habitus, ventral view; 3: Carapace, frontal view. 4–5. *Trygetus rectus* nov. spec., male holotype. 4: Habitus, dorsal view; 5: Habitus, ventral view. Scale bars = 0.5 mm (1, 2, 4, 5); 0.2 mm (3).

found (Jocqué, 1987) and that the habitat range of the genus will be expanded. The species *Enyo expers* O.P.-Cambridge, 1876, that was transferred by Levy (1992) to *Ranops* Jocqué, 1991, probably also belongs in *Dismadiorea*.

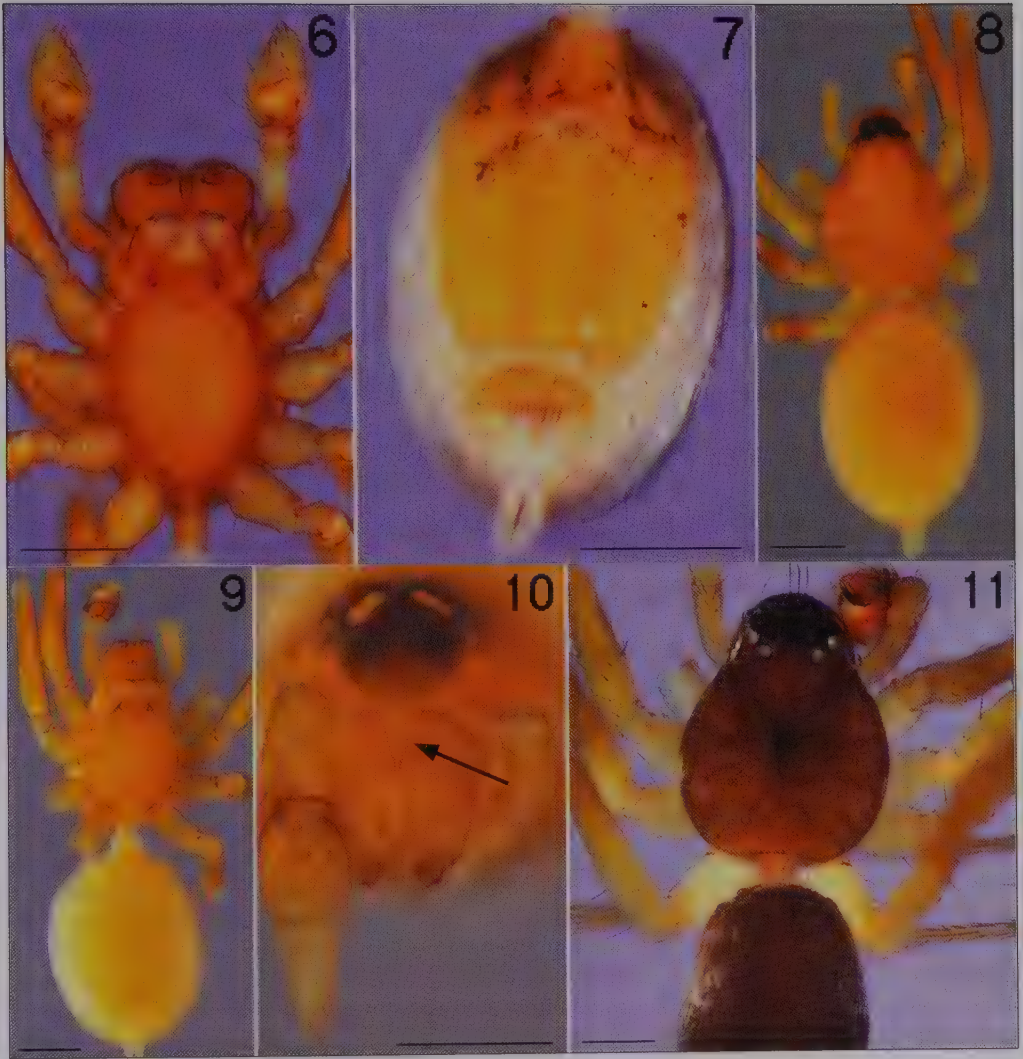
Distribution: Known only from the type locality.

Etymology: The specific name '*deserticola*' refers to habitat in which the holotype was found.

***Trygetus rectus* Jocqué nov. spec.**

Plates 4–7, 13, 17; Figures 3–6

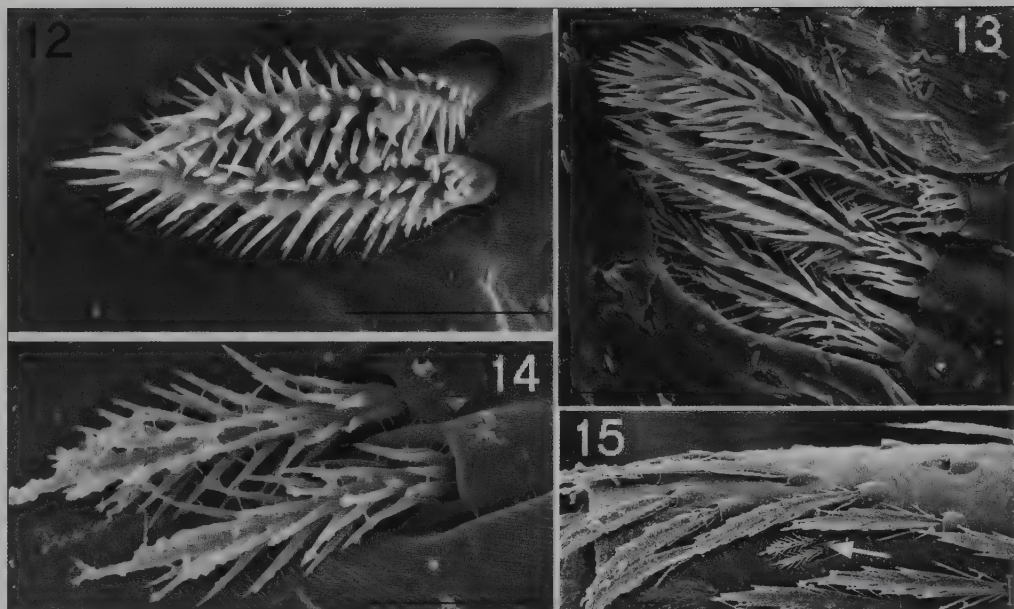
Specimens examined. Holotype: ♂, United Arab Emirates, Sharjah Desert Park, 25°17'N 55°42'E, 25.i–22.ii.2005, in light-trap, leg. A van Harten (MRAC 233876). Paratype: 1♀, Wadi Shawkah, 25°06'N 56°01'E, 5–24.vi.2007, water traps, leg. A. van Harten (MRAC 233875).



Plates 6–11. 6–7. *Trygetus rectus* nov. spec., male holotype. 6: Prosoma ventral view; 7: Opisthosoma, ventral view. 8–10. *Zodarion simplex* nov. spec., male paratype. 8: Habitus, dorsal view; 9: Habitus, ventral view; 10: Carapace, frontal view showing intercheliceral triangle (arrow). 11: *Parazodarion raddei* (Simon), habitus, dorsal view. Scale bars 0.2 mm (6–11).

Diagnosis: The male of this species is recognized by the presence of a posterior regular extension covering the base of the embolus and the tiny median apophysis, the female by the straight posterior margin and the absence of an anchoring hole in the epigyne. The latter character is shared with *T. jacksoni* Marusik & Guseinov, 2003, but in that species the internal structure of the epigyne is very different and the abdomen lacks scuta (Marusik & Guseinov, 2003).

Description. Male (holotype). Total length 2.36, carapace 1.04 long and 0.64 wide. Colour as in Plates 4–7. Carapace, chelicerae and sternum brownish orange; ocular area blackened; legs



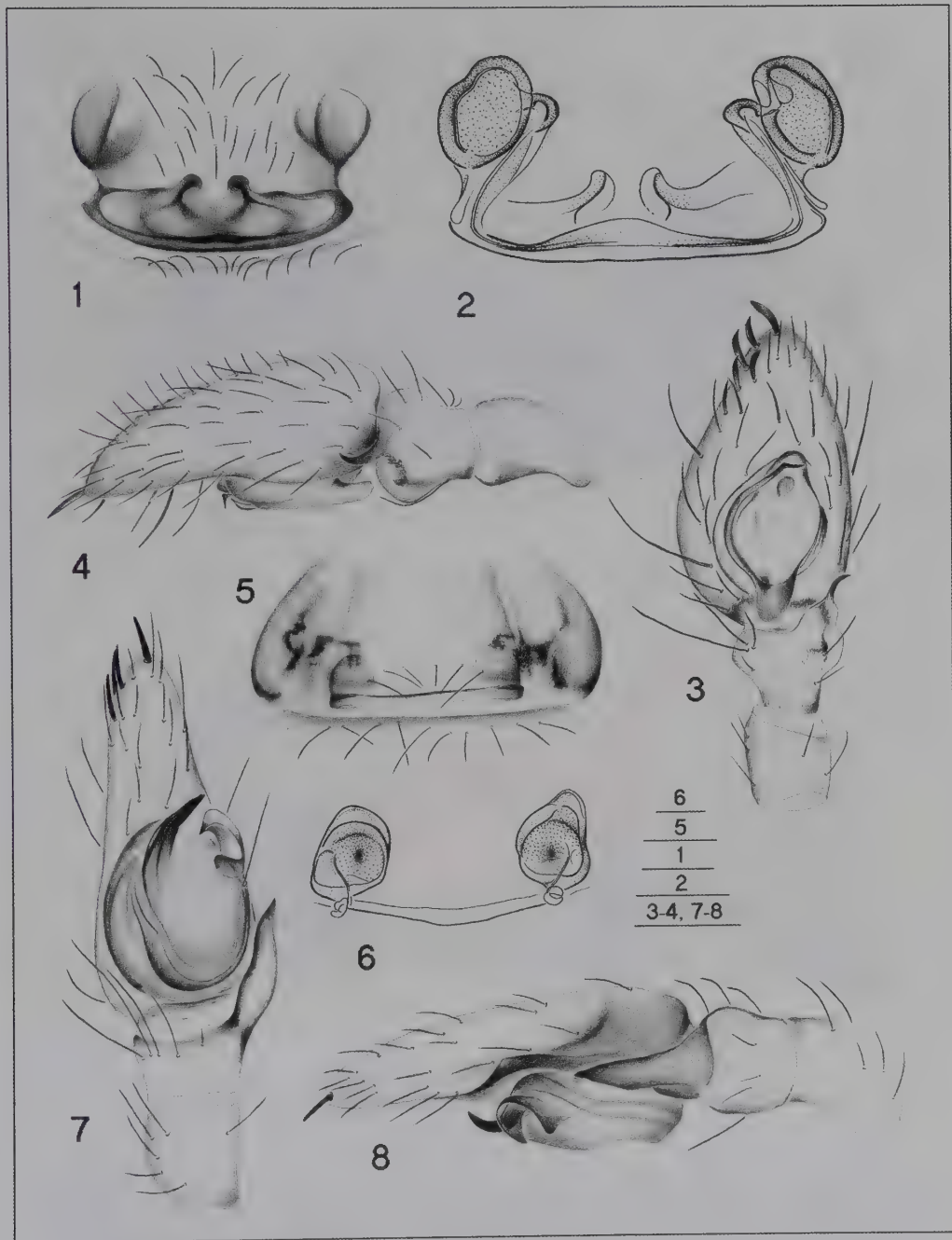
Plates 12–15. Scanning electron micrographs of femoral organs. 12: *Parazodarion raddei* (Simon), femur I of male. 13: *Trygetus rectus* nov. spec., femur II of female. 14–15: *Zodarion simplex* nov. spec. 14: Femur I of male; 15: Femur I of male showing flattened incised setae and femoral organ (arrow). Scale bars = 10µm.

yellowish orange; abdomen pale with pale dorsal scutum mottled with black and yellow ventral scuta. Carapace with a few dispersed bristles. Eyes, AME 0.10, ALE 0.04, PME absent, PLE 0.04. AME-AME 0.05, AME-ALE 0.02; width of AME pair: 0.25. Clypeus 0.21, with few bristles. Chelicerae 0.33 long, 0.21 wide, with very short, thick fang. Sternum 0.61 long, 0.49 wide; slightly reticulated, with a few dispersed setae. Legs, spineless, with well developed femoral organ composed of three complex setae in a shallow alveolus (Plate 13). Abdomen oval; dorsum completely covered with smooth scutum; venter with three scuta, one in front of epigastric groove surrounding pedicel, almost continuous with one behind epigastric groove but leaving spermpore in between; small oval scutum in front of spinnerets provided with row of 12 short modified setae. Palp as in Plates 18 and 19. Tibia with short, sharp apophysis curved upward; cymbium with six subdistal modified setae; tegulum with posterior extension; embolus fairly simple slightly geniculate near tip; median apophysis, oval, small, inconspicuous.

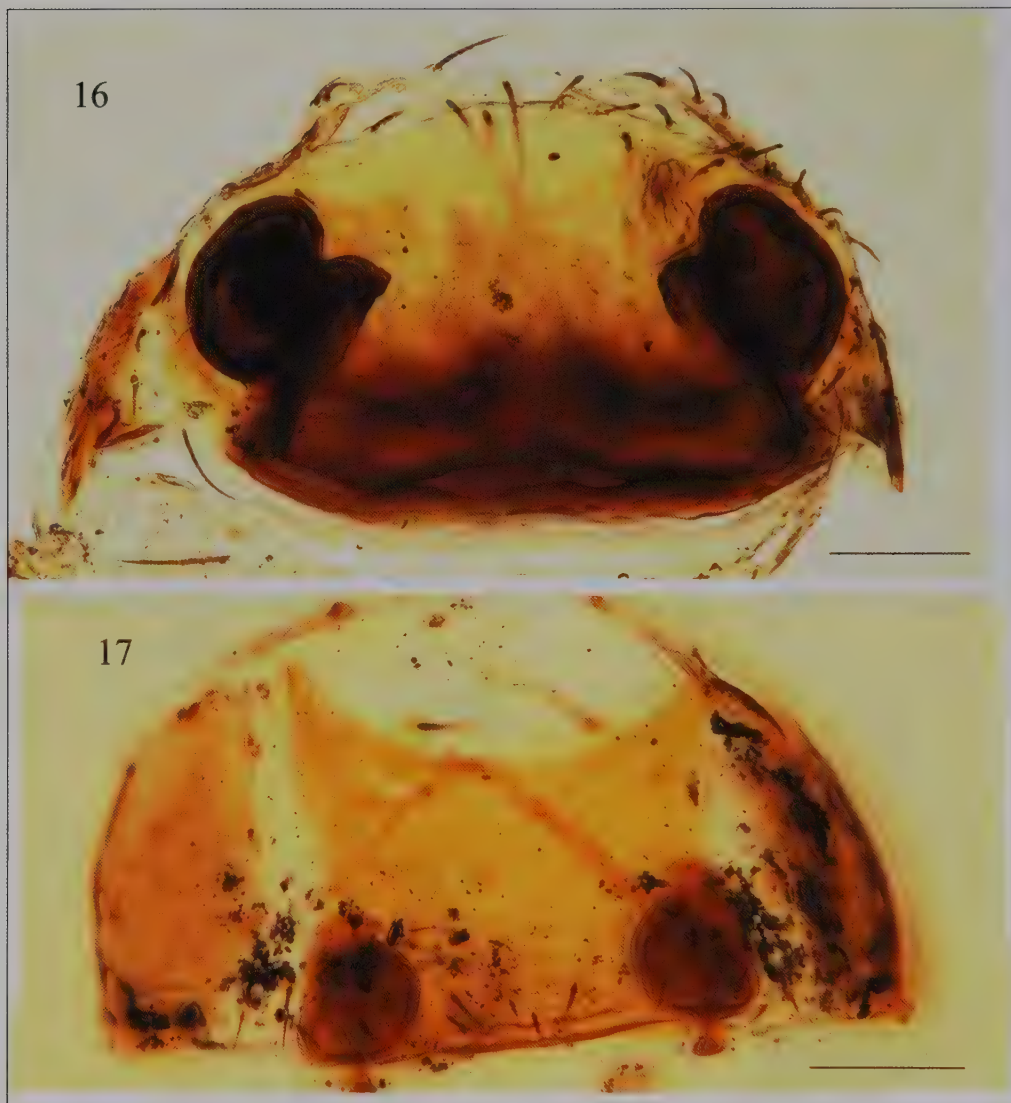
Female (paratype). Very similar to male except for absence of both the anterior ventral abdominal scuta. Total length 2.28, carapace 1.00 long and 0.64 wide. Colour, as in male except for dorsal scutum entirely black. Abdomen, oval; dorsum covered for 90% by smooth scutum; venter oval scutum in front of spinnerets provided with row of 12 short modified setae. Epigyne (Plate 17; Figs 5–6). Two widely separated copulatory openings, leading into short copulatory ducts towards spermathecae.

Distribution: Known only from the UAE.

Etymology: The specific name '*rectus*', refers to the straight posterior margin of the epigyne.



Figures 1–8. 1–2. *Dusmadiores deserticola* nov. spec., female holotype. 1: Epigyne, ventral view; 2: Epigyne, cleared, dorsal view. 3–5. *Trygetus rectus* nov. spec., male holotype. 3: Male palp, ventral view; 4: Male palp, retrolateral view. 5–6. *Trygetus rectus* nov. spec., female paratype. 5: Epigyne, ventral view; 6: Epigyne, cleared, dorsal view. 7–8. *Zodarion simplex* nov. spec., male paratype. 7: Male palp, ventral view; 8: Male palp, retrolateral view. Scale bars = 0.1 mm.



Plates 16–17. 16: *Dusmadiores deserticola* nov. spec., female holotype. epigyne, cleared, dorsal view; 17: *Trygetus rectus* nov. spec., epigyne, cleared, dorsal view. Scale bars = 0.1 mm.

***Zodarium simplex* Jocqué nov. spec.**

Plates 8–10, 14–15; Figures 7–8

Specimens examined: Holotype: ♂, United Arab Emirates: Wadi Safad, 25°13'N 56°19'E, 1–8.vii.2006, light-trap, leg. A.van Harten (MRAC 233878). Paratypes: 2♂, Wadi Madaq, 25°18'N 56°07'E, 24.ix–22.x.2006, water-traps, leg. A. van Harten (MRAC 233879).

Diagnosis: The male of this species is recognized by the patternless pale yellow habitus and the shape of the tibial apophysis

Description: Male (holotype). Total length 2.36, carapace 1.04 long and 0.64 wide. Colour as in Plates 8–10. Carapace, chelicerae, sternum and legs pale yellow; area around AME

blackened; abdomen pale grey, with poorly defined central longitudinal line, venter pale. Carapace (Plates 8–10) with a few small bristles, some longer ones in ocular area. Eyes, AME 0.12, ALE 0.07, PME 0.07, PLE 0.06; AME-AME 0.03, AME-ALE touching, PME-PME 0.11, PME-PLE 0.02; MOQ a perfect quadrangle of 0.28 wide and long. Clypeus 0.21, with few fairly long bristles. Chelicerae 0.33 long, 0.21 wide, with very short, thick fang. Sternum 0.57 long, 0.52 wide; smooth with few dispersed setae. Legs spineless, with small femoral organ composed of two setae with fairly few barbs (Plates 14, 15). Abdomen oval; completely membranous; row of 8 short modified setae on slightly sclerotized crescent shaped area in front of tracheal spiracle. Palp as in Figures 7, 8. Tibia with slightly sinuous, sharp apophysis; cymbium with small distal spine and three subdistal modified setae; embolus fairly simple, slightly curved, thorn shaped; median apophysis u-shaped.

Female unknown.

Distribution: Known only from the UAE.

Etymology: The specific name '*simplex*' refers to the very simple structure of the male palp.

***Parazodarium raddei* (Simon, 1889)**

Plates 11, 12

Zodarium raddei Simon, 1889: 383 (description ♂);

Zodarium vlasovi Sytshevskaja, in Vlassov & Sytshevskaja, 1937: 249 (description ♂, ♀);

Zodarium raddei, Denis, 1958: 111;

Zodarium raddei, Fet, 1985: 274 (synonymized *vlasovi*);

Parazodarium raddei, Ovchinnikov, Ahmad & Gurko, 2009: 471 (description ♂, ♀).

Specimens examined: Al-Ajban, 2juv., 27.v–26.vi.2006, in light-trap, A van Harten. Wadi Wurayah farm, 2♂, 2juv., 13.i–2.iii.2009, Malaise trap, A. van Harten.

Remarks: The species was well described and illustrated by Ovchinnikov et al. (2009). The validity of the genus will be addressed in a paper treating the phylogeny of the family. We here add a photograph of the habitus (Plate 11) and of a detail of the femoral organ (Plate 12) which has two finely divided setae. It is important to note that the legs do not have a tibial crack.

The species has a very large distribution in Central Asia.

ACKNOWLEDGEMENTS

I thank Tony van Harten for making the presently studied specimens available for study and to Ariel Chipman for the loan of *Ranops expers* specimens. I am indebted to Alain Reygél for the drawings.

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Author's address:

Dr. R. Jocqué, Royal Museum for Central Africa, B-3080 Tervuren, Belgium; e-mail: rudy.jocque@africamuseum.be

Order Araneae, family Salticidae

Additions and the description of a new species

Wanda Wesolowska and Antonius van Harten

INTRODUCTION

The salticids of the United Arab Emirates were lately studied by Wesolowska & van Harten (2010) and are relatively well known. Hitherto thirty species have been reported from this country. Newly collected material allows for extending the knowledge of these spiders. One new species – *Chalcoscirtus picinus* (♀) – is described. Three species are recorded from the UAE for the first time: *Evarcha seyun* Wesolowska & van Harten, 2007, *Hasarius adansoni* (Audouin, 1826) and *Menemerus marginatus* (Kronenberg, 1855). This study increases the number of salticid species known from the UAE to 34. For several species additional distributional data are given. The female described by Wesolowska & van Harten (2010) as the female of *Menemerus affinis* was erroneously matched with male; it actually belongs to *M. marginatus* (Kronenberg, 1855).

The specimens studied were collected in 2009 and the beginning of 2010 (some specimens also in 2007) and are deposited in the Naturhistorisches Museum Basel (Switzerland), the Zoological Museum of the Moscow University (Russia), the Biodiversity Management Sector Wildlife Conservation of Environment Agency in Abu Dhabi (UAE) and the United Arab Emirates Invertebrate Collection. The holotype of *Chalcoscirtus picinus* is kept at the Royal Museum for Central Africa, Tervuren (Belgium). If not stated otherwise, specimens were collected by A. van Harten. For methods and abbreviations used see Wesolowska & van Harten (2010).

SYSTEMATIC ACCOUNT

Bianor albobimaculatus (Lucas, 1846)

Specimens examined: Between Ra's al-Khaimah and Dibba, 1♂, 25.i.2010, WT, leg. M. Jäch. Wadi Madaq, 1♂, 27.iv–14.v.2009, WT; 1♂, 17–22.x.2009, WT.

Chalcoscirtus picinus Wesolowska & van Harten **nov. spec.**

Figures 1–2

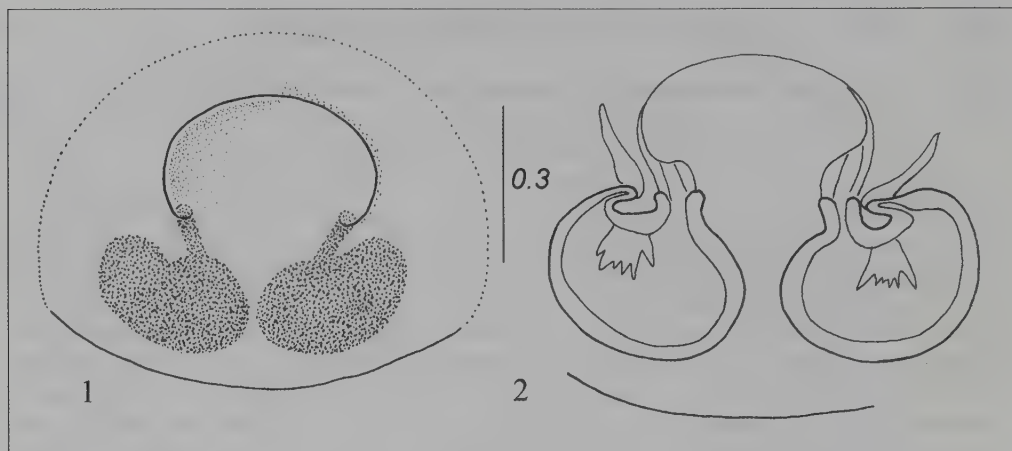
Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Bih dam, 25°48'N 56°04'E, water trap, 1–19.i.2010, leg. A. van Harten (Royal Museum for Central Africa, Tervuren).

Diagnosis: The female is distinguishable by the small central 'window' of epigyne, clearly narrower than in the congeners.

Description: Measurements [in mm]. Cephalothorax length 1.4, width 1.0, height 0.5. Abdomen length 2.0, width 1.5. Eye field length 0.5, anterior and posterior width 0.8.

Male unknown.

Female. Small spider, shape and colouration typical for the genus. Carapace oval, flattened, with short eye field. Coloration of carapace dark greyish brown, eye field black with blue metallic shine. Some long brown bristles on eye field, at first row of eyes. Clypeus very low. Chelicerae with two small teeth on promargin and toothless retromargin, only a few long bristles on it. Mouth parts brownish black. Abdomen oval, slightly swollen, blackish grey (dorsum partially bleached), clothed in delicate brown hairs. Spinnerets dark. Legs whitish yellow, spines light brown, leg hairs brownish. Epigyne with small oval membranous



Figures 1–2. *Chalcoscirtus picinus* Wesołowska & van Harten nov. spec., holotype. 1: Epigyne; 2: Internal structure of epigyne.

‘window’ in centre (Fig. 1), smaller than in other species. Seminal ducts very short, their initial part weakly sclerotized, receptacles bean-shaped, accessory glands large (Fig. 2). Etymology: The specific name is Latin and refers to the black colouration of the spider body.

***Cyrba ocellata* (Kroneberg, 1875)**

Specimens examined: Wadi Shawkah, 5♀, 15.iv.2007, leg. A.V. Gromov.

***Evarcha praeclara* Prószyński & Wesołowska in Prószyński, 2003**

Specimens examined: W of al-Ghail, desert, rocks & sand, 1♀, 12.iv.2007, leg. A.V. Gromov.

Distribution: Species known from Yemen and Palestine. For description and illustrations see Wesołowska & van Harten (2007). New to the UAE.

***Evarcha seyun* Wesołowska & van Harten, 2007**

Specimens examined: Ar-Rafah, 1♂, 1–19.i.2009, PT; 1♂, 1♀, 17.xi–14.xii.2009, PT; 1♂, 1–17.xi.2009, PT. Um al-Quwain, 1♂, 1–19.i.2010, PT; 1♂, 17–21.v.2009, WT. Wadi Bih dam, 1♂, 19.ii–8.iii.2009, MT; 3♂, 16–31.xii.2009, WT; 4♂, 1–19.i.2010, WT. Wadi Madaq, 1♂, 1♀, 27.iv–14.v.2009, WT. Wadi Shawkah, 2♂, 15.iv.2007, leg. A.V. Gromov; 1♂, 27.iv–14.v.2009 WT. Wadi Wurayah farm, 1♂, 31.v–14.vi.2009 MT.

***Hasarius adansoni* (Audouin, 1826)**

Specimens examined: Abu Dhabi, Environmental Agency Public Work Department, 1♂, 26.vi.2009, leg. A. Saji.

Distribution: Synanthropic species, cosmopolitan in warm climate, including the Mediterranean region; from the Arabian Peninsula known from Yemen (Wesołowska & van Harten, 2002). New to the UAE.

***Heliophanillus fulgens* (O. P.-Cambridge, 1872)**

Specimens examined: Al-Ain, 1♀, 15.x.2009, leg. K. Mahmood. Al-Ajban, canal shore, 1♂, 2♀, 2 imm., 18.iv.2007, leg. A.V. Gromov. N of Ajman, 1♂, 1♀, 21.ix–25.x.2007, WT. Wadi Bih dam, 1♂,



Plates 1–2. *Mememerus marginatus* (Kronenberg, 1855). 1: Male; 2: Female.

19.ii–8.iii.2009, MT; 1♂, 16–31.xii.2009, WT; 2♂, 1♀, 1–19.i.2010, WT. Wadi Madaq, 1♀, 27.iv–14.v.2009, WT. Wadi Shawkah, 1♀, 14.III.2010, leg. K. Mahmood; Wadi Wurayah farm, 1♀, 17.iii–8.iv.2009, MT; 1♂, 31.v–16.vi.2009, MT.

***Heliophanus abditus* Wesolowska, 1986**

Specimens examined: W of al-Ghail, desert, rocks & sand, 1 imm., 12.iv.2007, leg. A.V. Gromov.

Remarks: The species may be distinguished by the characteristic colouration of the abdomen (Wesolowska & van Harten, 2002).

***Langona pallida* Prószyński, 1993**

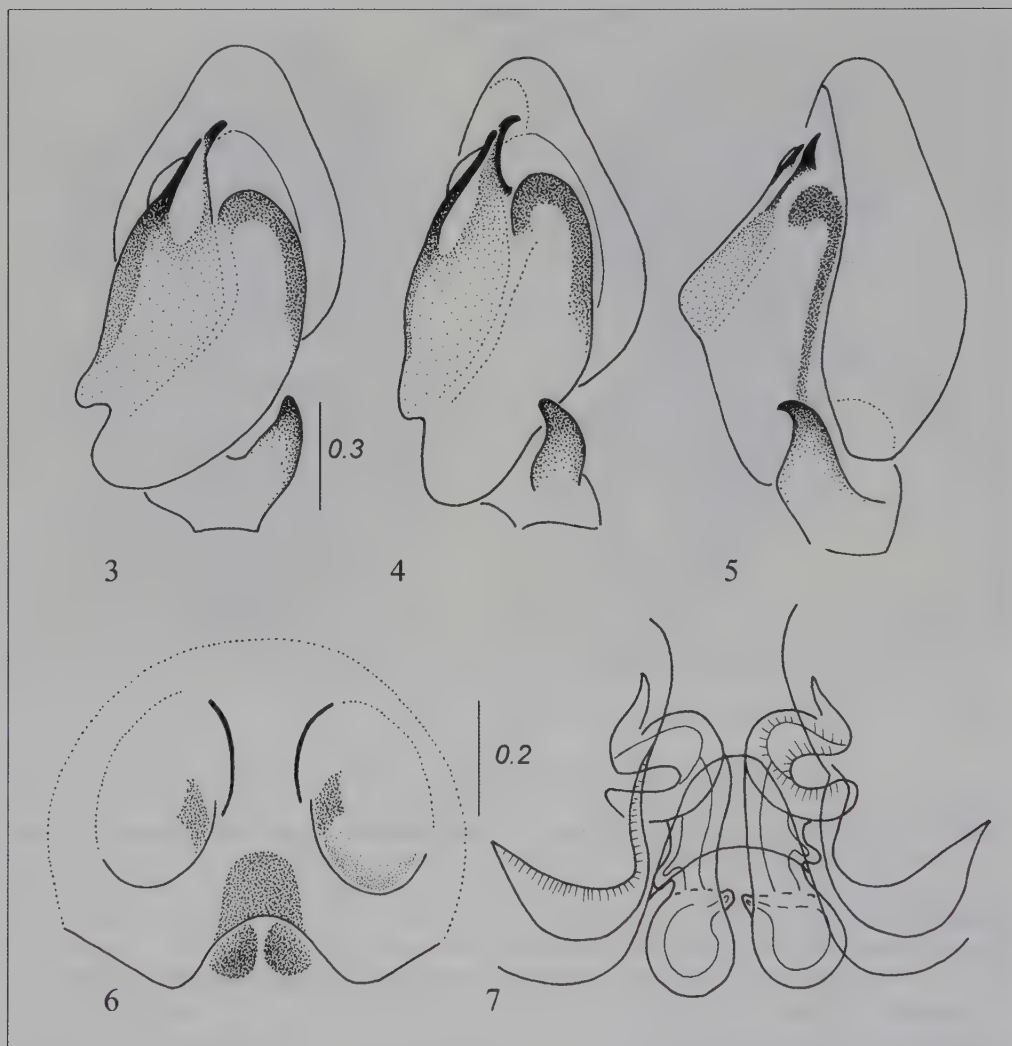
Specimens examined: Abu Dhabi, Environmental Agency Public Work Department, 4♂, 5♀, 28.vi.2009, leg. A. Saji. Ar-Rafah, 1♂, 1–19.i.2009, PT. Ra's al-Khaimah, 1♂, 25.i.2010, leg. M. Jäch. Between Ra's al-Khaimah and Dibba, 1♀, 17–22.x.2009, WT. Sharjah Desert Park, centre office wall, 2♀, 17.iv.2007, leg. A.V. Gromov. Um al-Quwain, 1♂, 17–21.v.2009, WT; 1♂, 1♀, 1–17.xi.2009, PT; 1♂, 14–31.xii.2009, PT; 1♂, 1♀, 1–11.ii.2010, PT. Wadi Bih dam, 2♂, 16–31.xii.2009, WT; 3♂, 2♀, 1–19.i.2010, WT; 1♂, 1♀, 1–11.ii.2010, WT. Wadi Shawkah, 17♂, 3♀, 27.iv–14.v.2009 WT.

***Menemerus marginatus* (Kronenberg, 1855)**

Figures 3–7, Plates 1–2

Menemerus affinis: Wesolowska & van Harten, 2010, part – ♀ only

Specimens examined: National Avian Research Centre, 12 km SE of Sweihan, under stones and garbage, 1♂, 26.iv.2007, leg. A.V. Gromov. Wadi Fayah, 7 km SW of Maleihah, dunes, under stones, 1♂, 1♀; 13.iv.2007, leg. A.V. Gromov; 1♂, 1♀, 20.iv.2007, leg. A.V. Gromov; 1♂, 2 ♀, 1 imm., 23.iv.2007, leg. A.V. Gromov.



Figures 3–7. *Mememerus marginatus* (Kronenberg, 1855). 3 Palpal organ in ventral view; 4: Same in ventrolateral view; 5: Same in lateral view; 6: Epigyne; 7: Internal structure of epigyne.

Description: Measurements (male/female). Cephalothorax length 2.8–3.1/3.1, width 2.1–2.4/2.2, height 1.0/1.0. Abdomen length 3.1–3.6/4.8, width 2.0/3.0. Eye field length 1.2–1.4/1.2, anterior width 1.7–1.8/1.7, posterior width 1.6–1.7/1.6.

Male. General appearance as in Plate 1. Medium sized spider with flattened body. Carapace brown with white bands along lateral margins, eye field black, long bristles near eyes. Delicate white hairs cover dorsal surface of carapace, on thoracic part form wide light streak. Clypeus very low. Mouth parts and sternum dark brown. Abdomen ovoid, greyish brown with slightly lighter median area – pattern composed of two thin lines in anterior part and patch posteriorly. Sides light, venter grey with two lines formed by light dots. Spinnerets brownish. Brown hairs on abdomen, denser and longer at anterior edge. Legs brown, first pair darker,

bearing dark hairs and spines. Pedipalps brown, white hairs on femur. Structure of palpal organ as in Figures 3–5, single robust tibial apophysis, embolus with additional distal lamella. Female. General appearance as in Plate 2. Similar to male, slightly larger. Abdomen brownish with wide lighter median band, legs brownish with darker rings and stains. Epigyne oval, very strongly sclerotized, with two oval depressions (plugged with waxy secretion) and large pocket near epigastric furrow, posterior edge with deep notch (Fig. 6). Internal structure typical for members of this genus, gonopores in deep strongly sclerotized ‘cups’, seminal ducts short, with accessory glands leading into the ducts, receptacles spherical (Fig. 7).

Remarks: The female of this species was erroneously matched with the male of *Menemerus affinis* in our previous paper (Wesołowska & van Harten, 2010).

Distribution: The species is known from Central Asia: Azerbaijan, Tajikistan, Turkmenistan and Uzbekistan (Prószyński, 2010). New to the UAE.

***Mogrus logunovi* Prószyński, 2000**

Specimens examined: Um al-Quwain, 1♂, 24.v–7.vi.2009, WT; 1♂, 1–19.i.2010, PT. Wadi Shawkah, 7♀, 15.iv.2007, leg. A.V. Gromov. Wadi Zirku, 1♀, 1.v.2001, leg. C. Drew.

***Neaetha oculata* (O. P.-Cambridge, 1876)**

Specimens examined: Ar-Rafah, 1♀, 17.xi–14.xii.2009. PT. Um al-Quwain, 1♀, 1–17.xi.2009, PT.

***Pellenes geniculatus* (Simon, 1868)**

Specimens examined: Between Ra's al-Khaimah and Dibba, 1♀, 17–22.x.2009. WT. Um al-Quwain, 1♂, 1♀, 17–21.v.2009 WT; 1♂, 1♀, 24.v–7.vi.2009, WT; 1♂, 1–17.xi.2009, PT; 1♂, 14–31.xii.2009, PT; 3♂, 1–19.i.2010. PT. Wadi Bih dam, 9♂, 19.ii–8.iii.2009, MT; 4♂, 16–31.xii.2009, WT; 6♂, 1♀, 1–19.i.2010, WT; 1♂, 1♀, 1–11.ii.2010, WT. Wadi Madaq, 1♂, 1♀, 27.iv–14.v.2009, WT. Wadi Shawkah, 2♂, 27.iv–14.v.2009, WT. Wadi Wurayah farm, 2♀, 13.iii–8.iv.2009, MT; 1♂, 31.v–16.vi.2009, MT.

***Pellenes hedjazensis* Prószyński, 1993**

Specimens examined: N of Ajman, 1♂, 1♀, 21.ix–25.x.2007, WT.

***Phlegra bresnieri* (Lucas, 1846)**

Specimens examined: Wadi Shawkah, 1♀, 15.iv.2007, leg. A.V. Gromov.

***Plexippoides flavescens* (O. P.-Cambridge, 1872)**

Specimens examined: Abu Dhabi, Environmental Agency Public Work Department, 1♀, 14.v.2009, leg. A. Saji. Al-Ain, 1♂, 15.x.2009, leg. K. Mahmood.

***Plexippus paykulli* (Audouin, 1826)**

Specimens examined: Abu Dhabi, on wall, 1♂, 26.III.2009, leg. A. Saji. Al-Baih, W slope of Rus al-Jibal, 2♂, 1♀, 14.iv.2007, leg. A.V. Gromov & K. Mahmood. Port Saqr, 1♂, 1♀, 14.iv.2007, leg. A.V. Gromov. Sharjah, 3♂, 13.iv.2007, leg. A.V. Gromov. Sharjah Desert Park, 3♀, 17.iv.2007, leg. A.V. Gromov. Wadi Bih dam, 1♂, 19.ii–8.iii.2009, MT; 1♂, 16–31.xii.2009, WT. Wadi Fayah, farm, 5♀, 23.iv.2007, leg. A.V. Gromov. Wadi Ham, SSE of Bithnah, 1♂, 1♀, 21.iv.2007, leg. A.V. Gromov. Wadi al-Helo, 7 km SW of Kalba, 2♂, 2♀, 2 imm., 24.iv.2007, leg. A.V. Gromov. Wadi Madaq, 1♂, 1♀, 11.iv.2007, leg. A.V. Gromov. Wadi Safad, 5♀, 19.iv.2007, leg. A.V. Gromov.

***Rafalus arabicus* Wesołowska & van Harten, 2010**

Specimens examined: Near Jebel Hafit, 1♂, 21.x–16.xi.2009, PT. Wadi Madaq, 1♀, 27.iv–14.v.2009, WT. Wadi Shawkah, 1♀, 1 subadult. ♀, 10.iv.2007, leg. A.V. Gromov.

***Rafalus feliksi* Prószyński, 1999**

Specimens examined: Ar-Rafah, 2♂, 1♀, 17.xi–14.xii.2009, PT.

***Thyene imperialis* (Rossi, 1946)**

Specimens examined: Abu Dhabi, National Research Centre, 1♂, 13.ii.2009, leg. A. Saji. Near Munay, 1♀, 14.iii.2010, leg. K. Mahmood. Sharjah Desert Park, on wall, 1♂, 17.iv.2007, leg. A.V. Gromov. Um al-Quwain, 1♂, 17–21.v. 2009 WT. Wadi Bih dam, 3♂, 16–31.xii.2009, WT; 2♂, 1♀, 1–19.i.2010, WT. Wadi Madaq, 1♂, 27.iv–14.v.2009, WT. Wadi Shawkah, 1♂, 27.iv–14.v.2009, WT.

***Yllenus logunovi* Wesołowska & van Harten, 2010**

Specimens examined: Ar-Rafah, 1♂, 1♀, 1–17.xi.2009, PT; 4♂, 17.xi–14.xii.2009, PT. Um al-Quwain, 2♂, 12–16.iv.2009, WT; 41♂, 1♀, 17–21.v.2009, WT; ♂, 24.v–7.vi.2009, WT; 3♂, 5♀, 1–17.x.2009, PT; 4♂, 2♀, 17–22.x.2009, PT; 1♀, 14–31.xii.2009, PT; 11♂, 1–19.i.2010, PT;

***Yllenus tschoni* (Caporiacco, 1936)**

Specimens examined: Near Jebel Hafit, 1♀, 21.x–16.xi.2009, PT. Ar-Rafah, 2♂, 17.xi–14.xii.2009, PT; 1♀, 14–31.xii.2009, PT.

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Authors' addresses:

W. Wesołowska, Institute of Zoology, Wrocław University, Sienkiewicza 21, PL-50335 Wrocław, Poland; e-mail: tomwes@biol.uni.wroc.pl

A. van Harten, UAE Insect Project, P.O. Box 63799, Sharjah, United Arab Emirates; e-mail: tonyvanharten@gmail.com

Order Mesostigmata, family Trachyuropodidae

Jenő Kontschán

INTRODUCTION

The family Trachyuropodidae is one of the well-recognized groups of the suborder Uropodina. Their body is large, strongly sclerotised and covered by depressions and ridges dorsally and ventrally. Internal malae on gnathosoma are subdivided into numerous, apically pilose or smooth branches, characteristic T-shaped setae with a short stem and long cross-bar can be observed on the body of most of the species (Kontschán, 2007; Lindquist et al., 2009). Today we know more than 100 species of Trachyuropodidae from all over the world (Wiśniewski & Hirschmann, 1993). Wiśniewski & Hirschmann (1993) dealt with all species of the genus *Trachyuropoda* Berlese, 1888, which Hirschmann (1976) previously had subdivided into several species groups based on dorsal characters. Some of these species groups were later revised and elevated to generic level by Kontschán (2007).

During the elaboration of soil samples collected by Antonius van Harten in United Arab Emirates, a new species of *Leonardiella* Berlese, 1904, was found and is herewith described.

MATERIALS AND METHODS

Specimens were cleared in lactic acid and later stored in alcohol. Drawings were made with the aid of a drawing tube. Type specimens are deposited in the Soil Zoology Collections of the Hungarian Natural History Museum, Budapest and in the Natural History Museum of Geneva (Switzerland).

Abbreviations used: h1-h4: hypostomal setae; HNHM: Hungarian Natural History Museum; NHMG: Natural History Museum of Geneva. Measurements are given in μm , width of idiosoma was taken at the level of the coxae IV.

SYSTEMATIC ACCOUNT

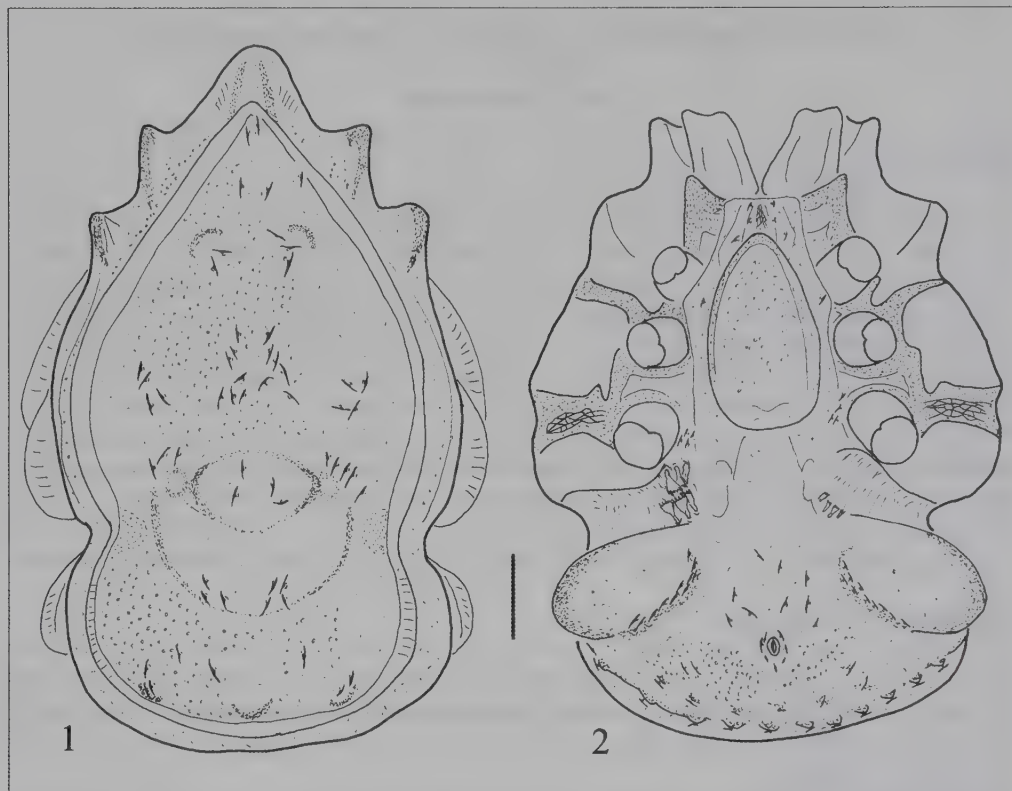
Leonardiella harteni Kontschán **nov. spec.**

Figures 1–9

Material examined: Holotype: ♀, UEA6909, United Arab Emirates, Sharjah, 12.iii.2007, from leaf litter of garden, leg. A. van Harten. Paratypes: 1♂, 1♀ deposited in HNHM, 2♀ in NHMG, locality and date as in holotype.

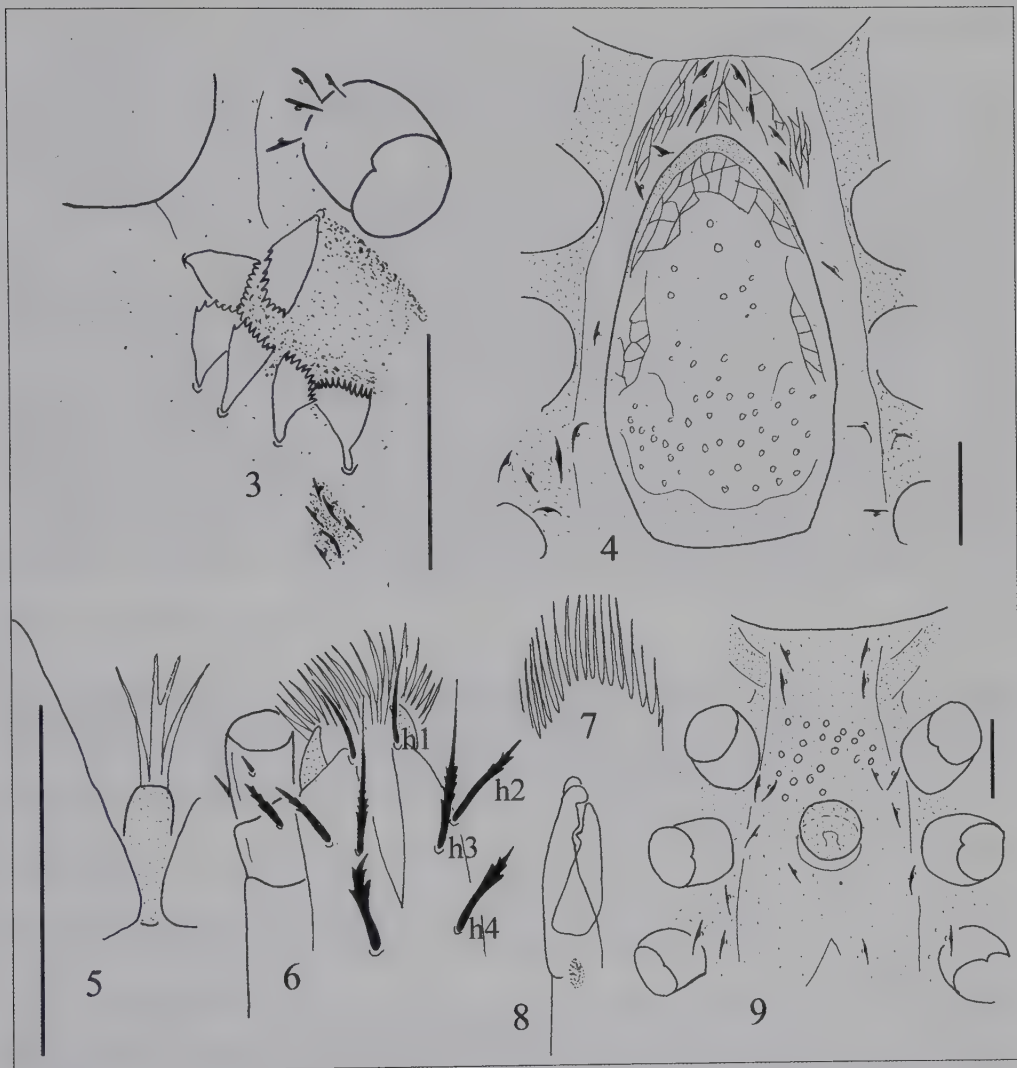
Diagnosis: Dorsal and marginal shields completely separated. Two strongly sclerotised semicircular lines on anterior area, three strongly sclerotised semicircular lines on caudal area of dorsal shield present. Sternal shield with reticulate sculptural pattern, genital shield of female linguliform, anterior margin rounded, covered by small oval pits on central region and ornamented by reticulate sculptural pattern near anterior margin. Two transversal furrows bordered with wide, apically serrate phylliform setae present on posterior area of coxae IV. Dorsal and ventral idiosoma bearing T-shaped setae and covered by small, oval pits.

Description: Female. Length of idiosoma 750–830 μm , width 480–520 μm (n=4). Shape oval, anterior margin with two pairs of rounded horns, and one pair of incisions below level of coxae IV, posterior margin rounded. Dorsal idiosoma (Fig. 1). Marginal and dorsal shields completely separated. Dorsal and marginal shields hypertrichous, all setae T-shaped. Two pairs of well sclerotised semicircular lines on anterior region, and three strongly sclerotised semicircular lines present on caudal margin of dorsal shield. Marginal shield wide, its anterior



Figures 1–2. *Leonardiella harteni* Kontschán nov. spec. 1: Dorsal view of female; 2: Ventral view of female. Scale bar = 100 μ m.

margin with two pairs of rounded horns, and one pair of incisions below level of coxae IV. Dorsal and marginal shields covered by small oval pits. Ventral idiosoma as in Figure 2. Sternal shield covered by reticulate sculptural pattern, all sternal setae T-shaped, their position are illustrated in Figure 4. Ventral setae T-shaped, several of them placed on small protuberances near caudal margin. Transversal furrows bearing wide, apically serrate phylliform setae present near posterior margin of coxae IV (Fig. 3). One pair of large, shallow, oval depression presents with strongly sclerotised margins bearing T-shaped setae. These depressions situated on posterior margins of transversal furrows. Ventral shield covered by small, oval pits. Stigmata situated between coxae II and III. Peritremes not clearly visible. Genital shield linguliform, with rounded anterior margin and without apical process. Surface ornamented by reticulate sculptural pattern near anterior margin and small oval pits on other areas. Base of tritosternum narrow, tritosternal laciniae subdivided into four branches, two central branches apically pilose, two lateral branches smooth (Fig. 5). Gnathosoma as in Figure 6. Corniculi horn-like, internal malae subdivided into several smooth branches. Hypostomal setae as follows: h1 (ca. 25–27 μ m) smooth and placed near the anterior margin of gnathosoma, h2 (ca. 25–29 μ m), h3 (ca. 43–48 μ m) and h4 (ca. 27–28 μ m) marginally serrate. Epistome pilose (Fig. 7), movable digit of chelicera shorter than fixed digit, internal sclerotised node present (Fig. 8).



Figures 3–9. *Leonardiella harteni* Kontschán nov. spec. 3: Posterior area of coxae IV of female; 4: Intercoxal region of female; 5: Tritosternum of female; 6: Ventral view of gnathosoma of female; 7: Epistome of female; 8: Chelicerae of female; 9: Intercoxal region of male. Scale bar = 100 μm .

Male. Length of idiosoma 730 μm , width 470 μm ($n=1$). Shape of idiosoma, ornamentation and chaetotaxy of dorsal parts as in female. Sternal shield bearing T-shaped setae and covered by oval pits. Genital shield circular and placed between coxae III (Fig. 9). Ventral setae, ornamentation and gnathosomal processes similar to those of female.

Nymphs and larvae are unknown.

Remarks: The wide, apically serrate phylliform setae on the border of the two transversal furrows, the strongly sclerotised dorsal lines, the shape and the ornamentation of genital shield of female are unique character combinations in the genus *Leonardiella*.

Etymology: I dedicate the new species to Antonius van Harten, who collected this mite.

TAXONOMICAL NOTES:

The genus *Leonardiella* Berlese, 1904, was presented only as a species group (*canestriniana*-group) of the genus *Trachyuropoda* Berlese, 1888, by several authors (Mašán 2001; Wiśniewski, 1993; Wiśniewski & Hirschmann, 1993). Kontschán (2006) resurrected the genus and one year later (Kontschán, 2007) gave a diagnosis of this genus and presented a key to the trachyuropodid mite genera of the Carpathian Basin (including the differences between the genera *Leonardiella* and *Trachyuropoda*).

Till now only five *Leonardiella* have been described from the Holarctic region and four other from the tropics. Three species of *Leonardiella* occur in Europe: *L. canestriniana* (Berlese, 1891), *L. riccardiana* (Leonardi, 1895) and *L. septentrionalis* (Berlese, 1904). Two other species were described as *Trachyuropoda* species (*T. matsuurai* Hiramatsu, 1980, and *T. similiathiasae* Hiramatsu, 1979, both from Japan). Now I place these two and the four other species from the tropical region (*T. athiasae* Hirschmann, 1975 (Chad); *T. cristulata* Hirschmann, 1975 (Sri Lanka); *T. constricta* Banks, 1916 (Australia) and *T. whitcombi* Hirschmann, 1975 (Brasil)) into the genus *Leonardiella* as *L. athiasae* (Hirschmann, 1975) **nov. comb.**; *L. cristulata* (Hirschmann, 1975) **nov. comb.**; *L. constricta* (Banks, 1916) **nov. comb.**; *L. whitcombi* (Hirschmann, 1975) **nov. comb.**; *L. matsuurai* (Hiramatsu, 1980) **nov. comb.** and *L. similiathiasae* (Hiramatsu, 1979) **nov. comb.**

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Author's address:

Jenő Kontschán, Systematic Zoology Research Group of Hungarian Academy of Sciences, Hungarian Natural History Museum, H-1088, Budapest Baross u. 13., Hungary; e-mail: jkontschan@gmail.com

Order Isopoda, suborder Oniscidea

Stefano Taiti and Ilaria Checcucci

INTRODUCTION

At present 42 species of terrestrial isopods are known from the Arabian Peninsula (Barnard, 1941; Giordani Soika, 1954; Kheirallah, 1979a, 1979b, 1991; Athaur-Rahim, 1982; Ferrara & Taiti, 1986, 1988, 1990, 1996; Constantinou & Cloudsley-Thompson, 1987; Kheirallah & Abboud, 1989; Taiti & Ferrara, 1989, 1991; Taiti et al., 1997, 2000; Khalaji-Pirbalouty & Wägele, 2010). From the United Arab Emirates only four species of Oniscidea were previously recorded (Taiti & Ferrara, 1991): *Littorophiloscia strouhali* Taiti & Ferrara, 1991, *Littorophiloscia* spec. (= *L. tropicalis* Taiti & Ferrara, 1986, or *L. culebrae* (Moore, 1901)), *Periscyphis vittatus* Omer-Cooper, 1926, and *Somalodillo paeninsulae* Ferrara & Taiti, 1986. Of recent years Mr. Antonius van Harten, coordinator of the UAE Insect Project, sent us a large collection of terrestrial isopods from the UAE which increased considerably the number of species known from that part of the Arabian Peninsula. In this paper 17 species are recorded, four of which in the families Agnaridae and Eubelidae are described as new.

MATERIALS AND METHODS

Specimens examined, distribution and remarks (when necessary) are provided for each species. The specimens dealt with here are deposited in the United Arab Emirates Invertebrate Collection and in the Zoological Museum 'La Specola' of the University, Florence, Italy (MZUF). Unless otherwise stated, the specimens have been collected by Antonius van Harten.

SYSTEMATIC ACCOUNT

Family **Ligiidae**

Genus **Ligia** Fabricius, 1798

Ligia persica Khalaji-Pirbalouty & Wägele, 2010

Specimens examined: Khor Kalba lagoon, 2♂, 1♀, 12.iii.2005, hand collecting. Ar-Rams-Port Saqr, 8 juvs, 22.iv.2010, hand collecting, leg. K. Mahmood.

Remarks: Along the coasts of the Arabian Peninsula only one species of *Ligia* was previously known (*L. pigmentata* Jackson, 1922). As already discussed (Taiti & Ferrara, 1991; 2004; Taiti et al., 2000) this taxon includes more morphotypes that certainly refer to distinct species. A molecular analysis still in progress of the different morphotypes (M.A. Arnedo, pers. com.) seems to confirm that under this name more species are present. In a recent paper, Khalaji-Pirbalouty & Wägele (2010) described two new species: *Ligia persica* from the Iranian side of the Persian Gulf, and *L. yemenica* from the Gulf of Aden (Yemen). The specimens from the Emirates here examined, as well as those from the coasts the Persian Gulf and Oman Gulf in the Arabian Peninsula examined in the past, definitely correspond to *L. persica* and have to be identified as such.

Distribution: Coasts of Iran, Kuwait and Oman. New record for the UAE.

Family Tylodae

Genus *Tylos* Audouin, 1826

Tylos maindroni Giordani Soika, 1954

Plate 4

Specimens examined: N of Ajman, 1 juv., 1–19.ix.2007, water traps. Qurraya, 1♀, 12.xi.2007, at light, leg. C. Gielis. Near Qurraya, many ♂, ♀ and juvs, 19.ii.2005, hand collecting.

Distribution: Kuwait, Oman and Iran. New record for the UAE.

Family Halophilosciidae

Genus *Littorophiloscia* Hatch, 1947

Littorophiloscia strouhali Taiti & Ferrara, 1991

Plate 1

Specimens examined: Near Qurraya, 2♂, 1♀, 19.ii.2005, hand collecting, under sewage. Khor Kalba lagoon, 3♀, 12.iii.2005, hand collecting.

Distribution: Egypt, Sudan and UAE.

Family Platyarthridae

Genus *Platyarthrus* Brandt, 1833

Platyarthrus aiasensis Legrand, 1954

Specimens examined: Near al-Hajer, 3♀, 30.i.2005, in Berlese funnels.

Distribution: Species with a W Mediterranean-Atlantic distribution, introduced to USA (California, Texas), St. Barthelemy (Caribbean), Arabian Peninsula, and South Africa. New record for the UAE.

Family Agnaridae

Genus *Agnara* Budde-Lund, 1908

Agnara madagascariensis (Budde-Lund, 1885)

Specimens examined: Bithnah, 1♀, 31.xii.2005–2.ii.2006, light trap. Sharjah, 8♂, 16♀, 12 juvs., 16.i.2005, in Berlese funnels. Wadi Bih dam, 1♀, 24.iv–23.v.2007, light trap; 1♂, 13–30.iv.2008, light trap; 1♀, 9–29.vi.2008, light trap. Wadi Madaqa, 2♂, 3♀, 28.i.2006, in Berlese funnel; 5♂, 6♀, 10.xi–7.xii.2007, pitfall traps. Wadi Shawkah, 1♀, 24.xi–14.xii.2009, pitfall traps.

Distribution: Senegal, Guinea Bissau, Madagascar, Arabian Peninsula, Socotra (?), and southern China. New record for the UAE.

Agnara gallagheri Ferrara & Taiti, 1988

Specimens examined: Hatta-Huwaylat, 1♀, 12.iii.2005, hand collecting. Near Ra's al-Khaimah, 1♂, 8.iii.2005, hand collecting. Sharjah Desert Park, 1♂, 21.i–17.ii.2008, pitfall traps. Near Tayyibah, 5♀, 10.iii.2005, hand collecting.

Distribution: Oman. New record for the UAE.

Genus *Desertoniscus* Verhoeff, 1930

***Desertoniscus arabicus* Taiti & Checcucci nov. spec.**

Plate 2, Figures 1–21

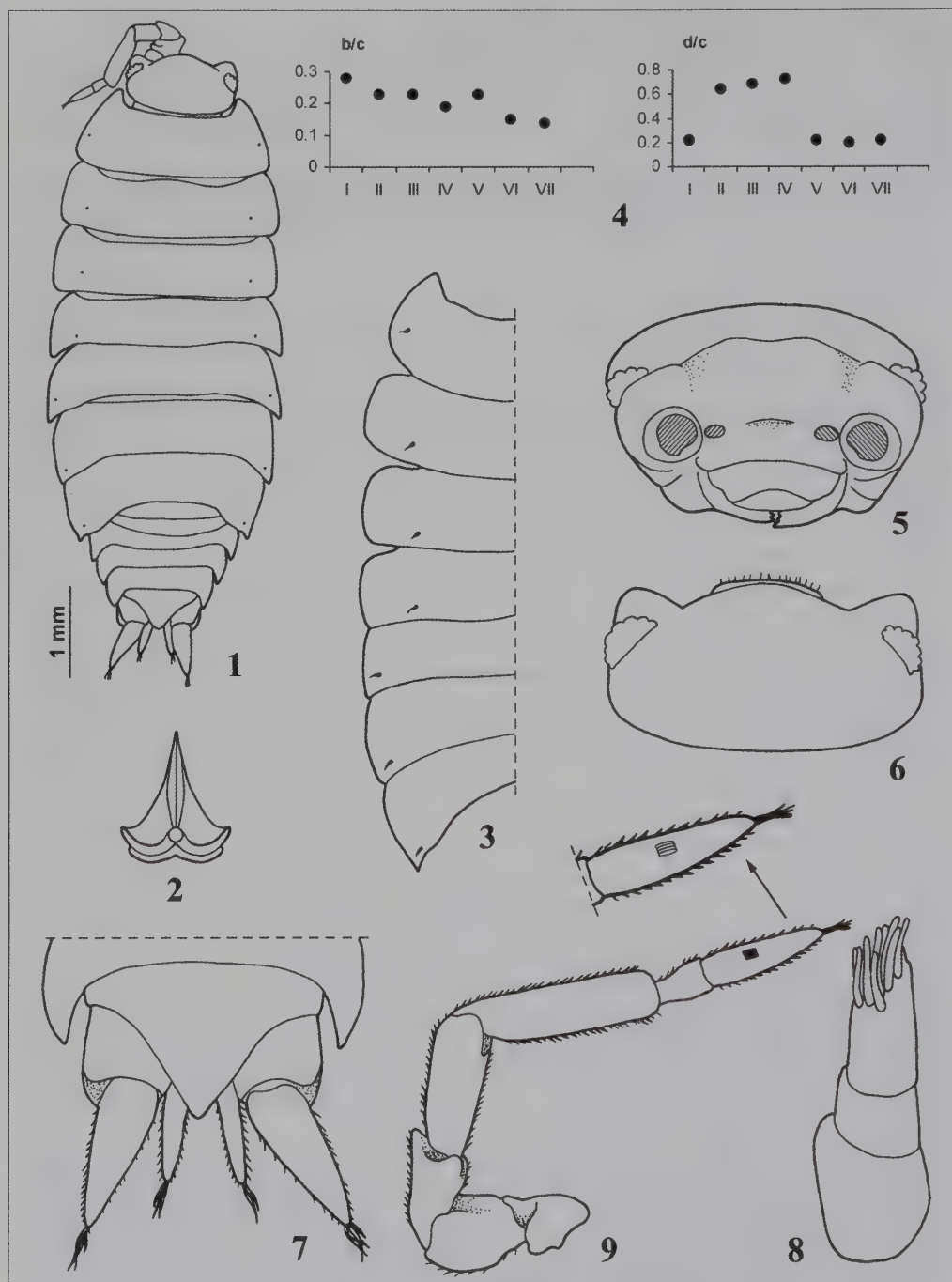
Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah, 25°2'N 55°24'E, in Berlese funnels, leaf litter from garden, 16.i.2005, leg. A. van Harten (MZUF). Paratypes: 7♂, 1♀, 4 juvs, same data as holotype. 2♀, ar-Rafah, 17.xi.2009, pitfall traps; 1♂, 1–11.ii.2010, pitfall traps. 1♂, 1♀, Um al-Quwain, 14–31.xii.2009, pitfall traps; 9♂, 12♀, 1–19.i.2010, pitfall traps. 1♀, Wadi Madaq, 11–18.vi.2006, light trap.

Diagnosis: A species of *Desertoniscus* characterized by the noduli laterales on pereionites 2 to 4 being much more distant from the lateral margin of the segment than those on pereionites 1 and 5 to 7, and male pleopod 1 exopod with obliquely truncate distal part and slightly concave distal margin.

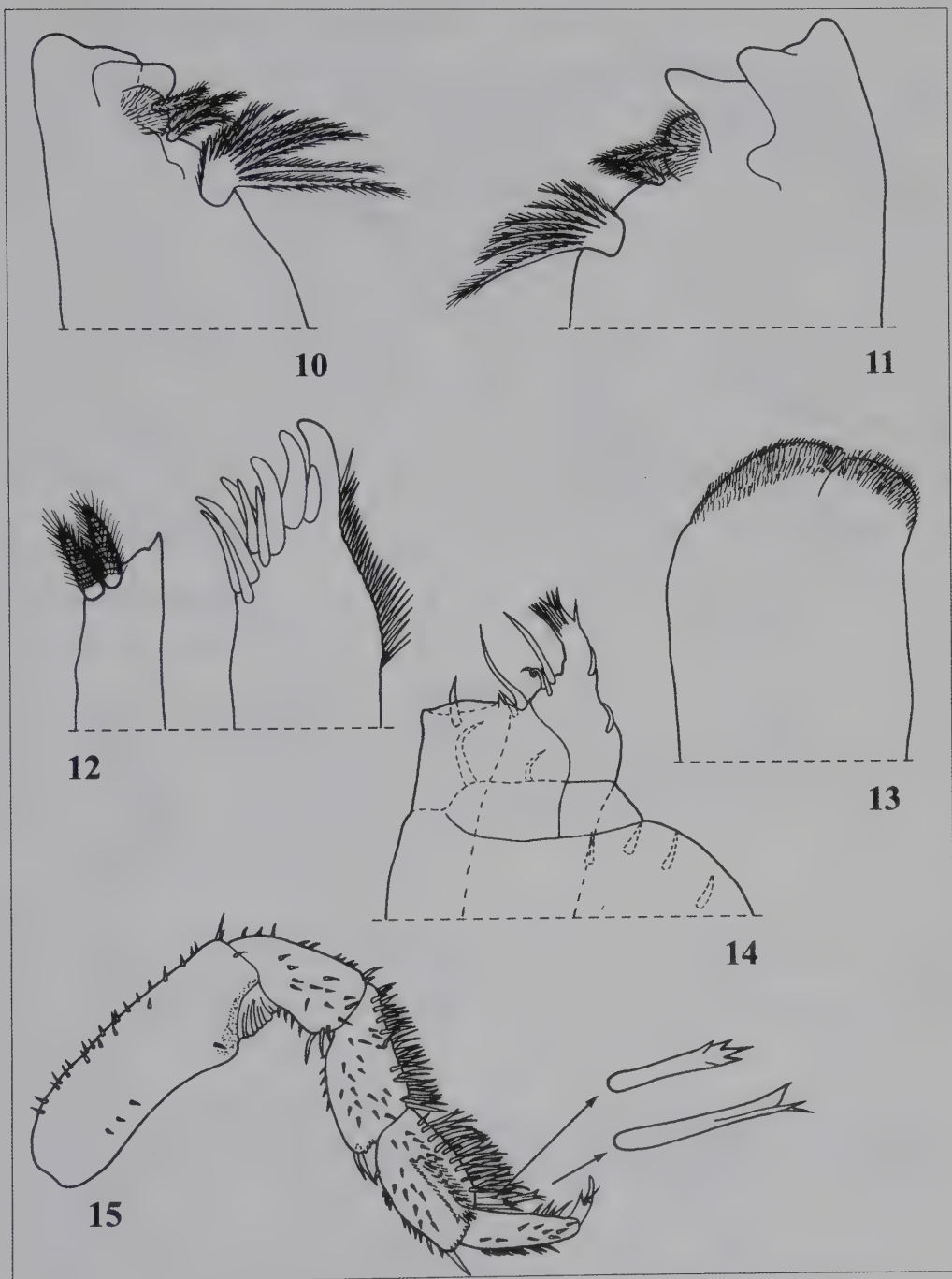
Description: Maximum length male and female 6.5 mm. Body elongated (about 2.5 longer than wide) (Fig. 1). Colour light brown with the usual pale muscles spots; a pale spot at base of pereion epimera; antennae, pereiopods, pleopods and uropodal exopods pale. Back smooth, thickly covered with small triangular scale-setae (Fig. 2); noduli laterales on pereionites 2 to 4 distinctly more distant from the lateral margins than those on pereionites 1 and 5 to 7 (Fig. 3), their co-ordinates as in Fig. 4; very small glandular fields, each with 2 or 3 gland pores, along anterior half of lateral margin of pereionites 1–4. Cephalon (Figs 5, 6) with frontal line slightly sinuous in frontal view, no suprantennal line; rounded lateral lobes not protruding compared with broadly rounded profrons; eyes with 10–12 ommatidia. Pereionites 1 and 2 with convex posterior margin and rounded posterolateral corners; pereionite 3 with straight posterior margin; pereionites 4 to 7 with posterolateral corners pointing backwards; pereionite 7 with posterior margin slightly sinuous at sides. Pleon slightly narrower than pereion; pleonites 3–5 with falciform epimera. Telson (Fig. 7) with distal triangular part surpassing posterior margin of uropodal protopod. Antennule (Fig. 8) of three articles with a tuft of long aesthetascs at apex. Antenna (Fig. 9) short, reaching posterior margin of pereionite 1; flagellum of two articles as long as fifth article of peduncle; second article of flagellum about 2.5 times as long as first and bearing a row of four aesthetascs. Mandible (Figs 10, 11) with molar penicil consisting of several plumose setae; 1+1 free penicils on the right mandible and 2+1 on the left. Maxillule (Fig. 12) with outer branch bearing 4+6 simple teeth; inner branch with two long penicils and a triangular posterior point. Maxilla (Fig. 13) distally bilobate and setose, inner lobe wider than outer one, three aesthetascs between the two lobes. Maxilliped (Fig. 14) endite with two small triangular teeth on anterior margin. Pleopod 1–5 exopods (Figs 17–19) with monospiracular covered lungs. Uropodal protopod with a small triangular incision on lateral margin; endopod inserted proximally to exopod.

Male: Pereiopod 1–3 carpus and merus with brushes of long trifid setae (Fig. 15). Pereiopod 7 ischium with slightly concave sternal margin. Pleopod 1 (Fig. 17) exopod with an obliquely truncate distal part with distal margin slightly concave, a short seta at apex, outer margin slightly concave with no setae; endopod with triangular apical part slightly bent outwards. Pleopod 2 (Fig. 18) endopod longer than exopod; exopod triangular with a line of strong setae on outer margin. Pleopod 3–5 exopods as in Figures 19–21.

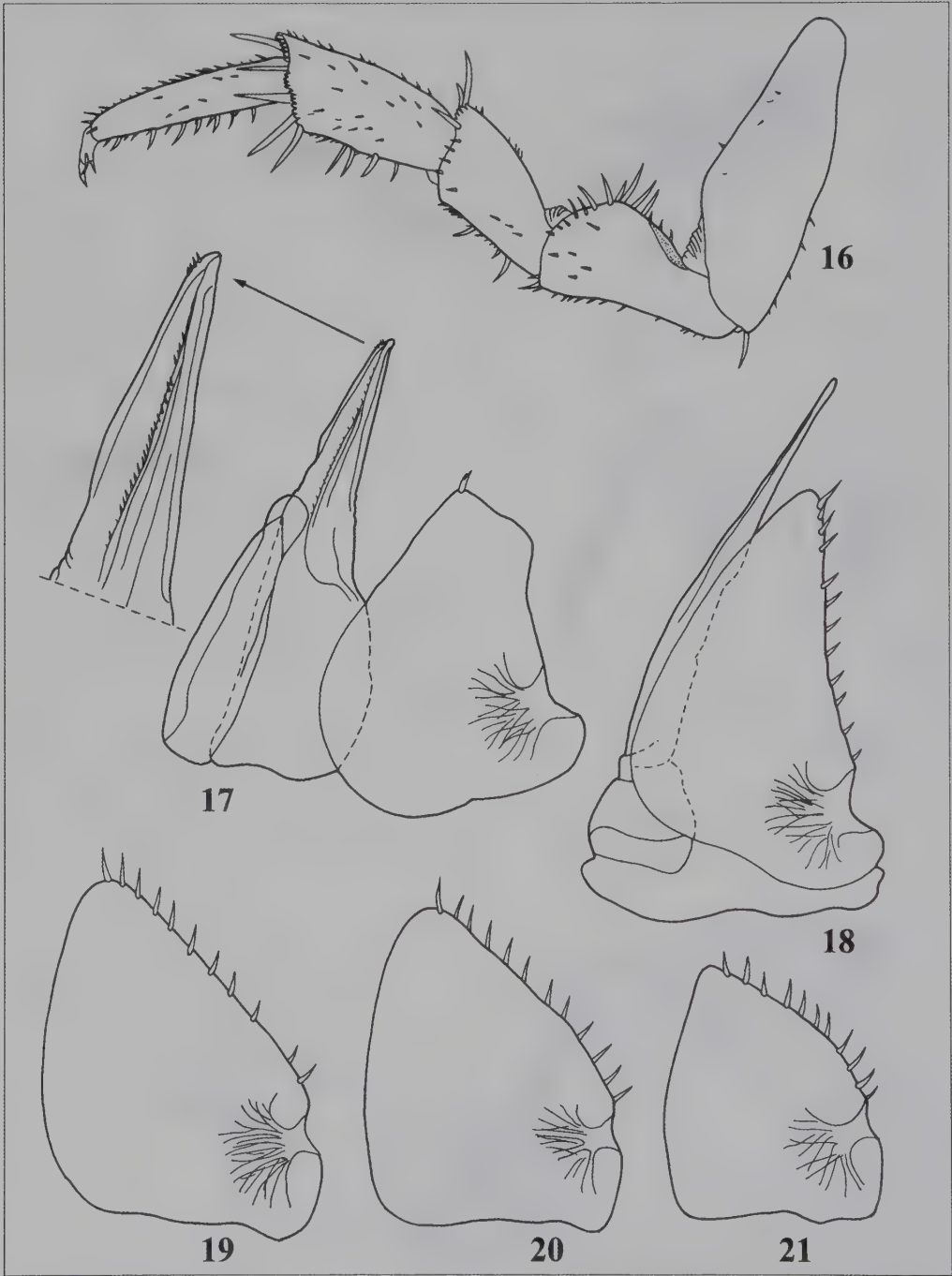
Remarks: The genus *Desertoniscus* was erected by Verhoeff (1930) for the new species *D. subterraneus* from Turkmenistan. Borutzky (1945) described seven new species in the genus: *D. elongatus*, *D. zenkewitschi*, *D. tuberculatus*, *D. bulbifrons*, *D. birsteini* all from Turkmenistan, and *D. zhelochovtzevi* from Uzbekistan. Borutzky (1975) transferred *D. zenkewitschi* and *D. tuberculatus* to the genus *Protracheoniscus* Verhoeff, 1917, and later (Borutzky, 1978) he described three new species: *D. kirghizicus* from Kyrgyzstan, *D. mongolicus* from northern Mongolia, and *D. reductus* from Tajikistan. In this paper he also stated that only the type-species *D. subterraneus*, divided into four subspecies, and the three



Figures 1-9. *Desertoniscus arabicus* nov. spec., male. 1: Adult specimen, dorsal view; 2: Dorsal scale-seta; 3: Left side of pereon showing disposition of noduli laterales; 4: Co-ordinates of noduli laterales; 5: Cephalon, frontal view; 6: Cephalon, dorsal view; 7: Pleonite 5, telson and uropods; 8: Antennule; 9: Antenna.



Figures 10–15. *Desertoniscus arabicus* nov. spec., male. 10: Left mandible; 11: Right mandible; 12: Maxillule; 13: Maxilla; 14: Maxilliped; 15: Pereiopod 1.



Figures 16–21. *Desertoniscus arabicus* nov. spec., male. 16: Pereiopod 7; 17: Pleopod 1 and genital papilla; 18: Pleopod 2; 19: Pleopod 3 exopod; 20: Pleopod 4 exopod; 21: Pleopod 5 exopod.

new species belonged to *Desertoniscus*, thus excluding all the species described by him in 1945.

According to Borutzky (1978), the genus is characterized within the family Agnaridae by the position of the noduli laterales on pereionites 1 to 4 being distinctly more distant from the lateral margins than those on pereionites 5 to 7, by the short antennae that reach back or slightly surpass the posterior margin of pereionite 1, and by the male pleopod 1 exopod distally more or less bilobate. The species from the UAE is included in *Desertoniscus* since it shows all these characters with the exception of the position of the nodulus lateralis on the pereionite 1 which is close to the lateral margin of the segment. The disposition of the noduli laterales is similar to that present in *Lucasioides* Kwon, 1993, but species in this genus have a more or less concave posterior margin at the sides of the pereionite 1 (see Kwon, 1993; Kwon & Taiti, 1993), while in *D. arabicus* it is regularly convex. However, *Desertoniscus* and *Lucasioides* seem to be morphologically very close and a revision of both genera is needed.

Desertoniscus arabicus differs from all the other species in the genus by the position of the nodulus lateralis on pereionite 1 and by the distal margin of the pleopod 1 exopod being very slightly concave instead of deeply concave. Considering that all the other species in the genus are distributed in central Asia, it is possible that the new species is introduced into the Arabian Peninsula.

Etymology: Latin *arabicus* = Arabian. The species is named after the Arabian Peninsula.

Family Porcellionidae

Genus *Porcellionides* Miers, 1877

Porcellionides pruinosus (Brandt, 1833)

Specimens examined: Khor al-Khwair, 1♀, 15–22.iii.2007, light trap. Sharjah Desert Park, 8♂, 7♀, 2 juvs, 10.xi.2004, leaf litter in Berlese funnel; 1♂, 1♀, 20–23.xi.2004, leaf litter in Berlese funnel. Wadi Madaq, 1♂, 10.xi–7.xii.2007, pitfall traps. Wadi Shawkah, 1♂, 24.xi–14.xii.2009, pitfall traps. Distribution: Cosmopolitan species of Mediterranean origin. New record for the UAE.

Genus *Agabiformius* Verhoeff, 1908

Agabiformius lentus (Budde-Lund, 1885)

Specimens examined: Sharjah Desert Park, 5♀, 3.iii.2005, hand collecting. Wadi Madaq, 2♂, 28.i.2006, in Berlese funnel. Bithnah, 1♀, 31.xii.2005–2.ii.2006, light trap. Distribution: Mediterranean area, introduced by human activities to many other parts of the world. New record for the UAE.

Agabiformius obtusus (Budde-Lund, 1909)

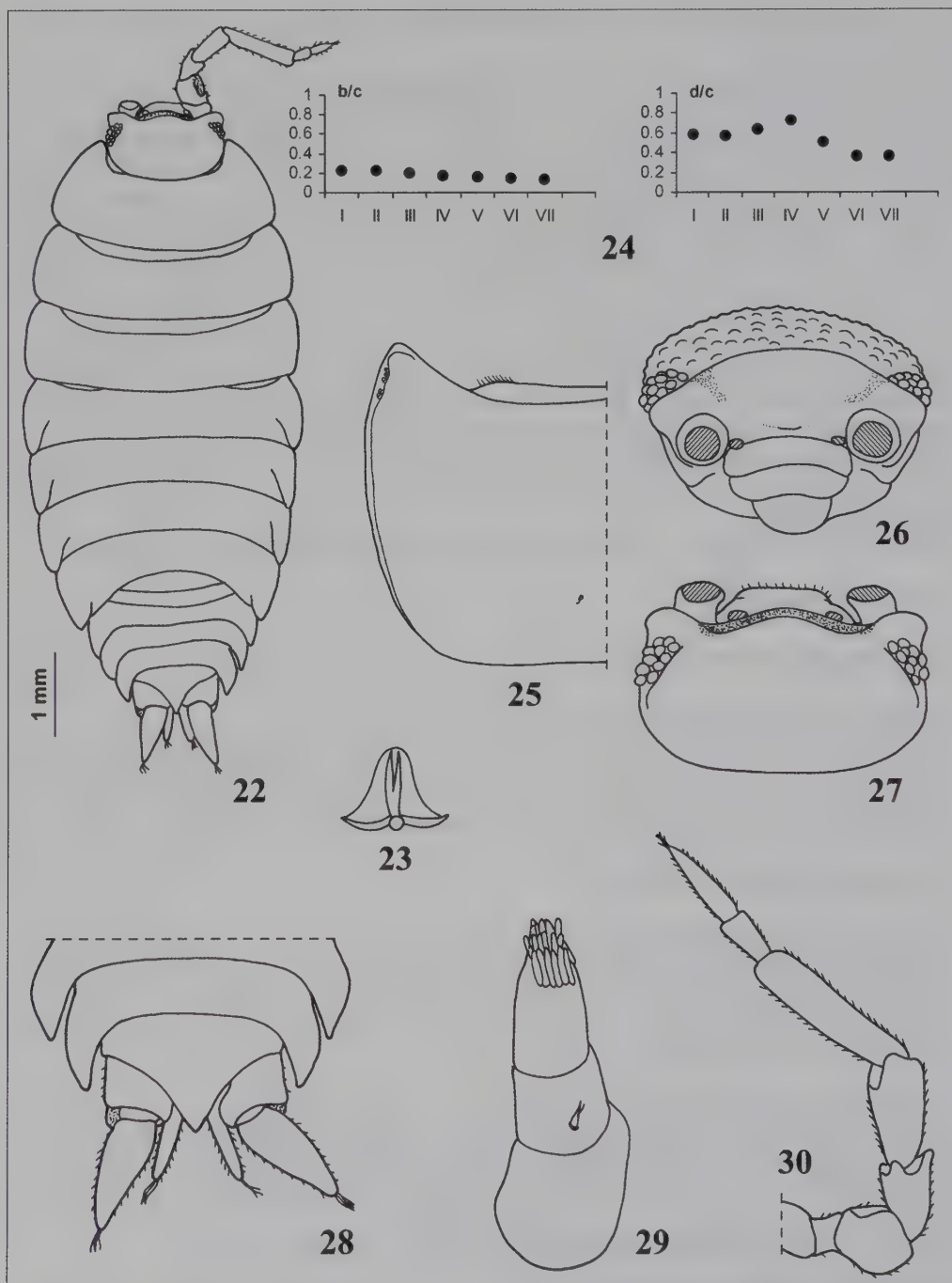
Specimens examined: Near al-Hajer, 1♂, 1♀, 15.i.2005, in Berlese funnel. Sharjah Desert Park, 2♂, 1♀, 20–23.xi.2004 leaf litter in Berlese funnel; 8♂, 9♀, 23 juvs, 10.xi.2004, from leaf litter (Berlese funnel); 1♂, 5♀, 3.iii.2005, hand collecting; 4♂, 5♀, 6–28.xii.2006, pitfall traps; 2♂, 1♀, 21.i–17.ii.2008, pitfall traps. Distribution: Mediterranean area, Sudan, Kuwait. New record for the UAE.

Genus *Proporcellio* Verhoeff, 1907

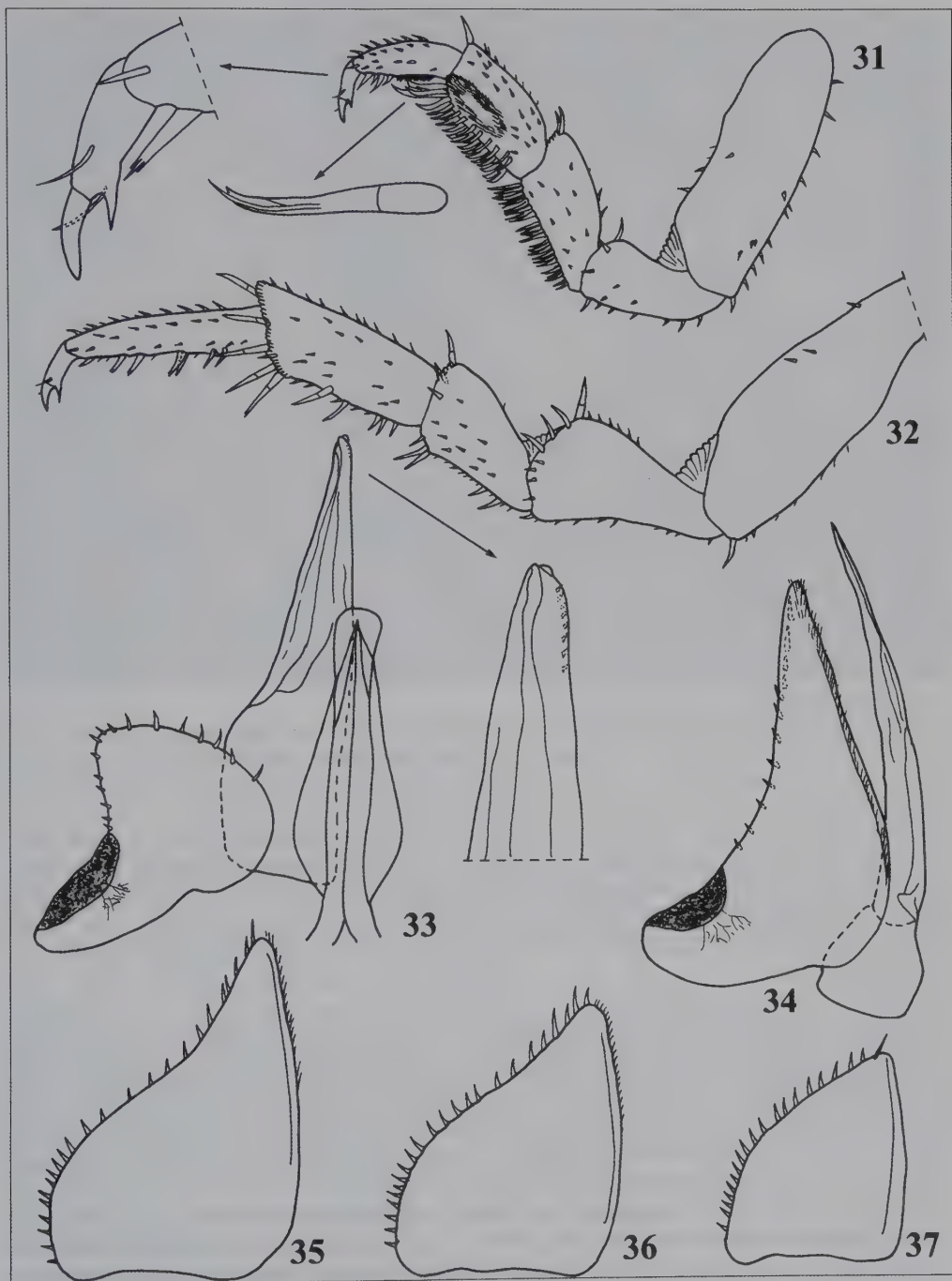
Proporcellio spec.

Figures 22–37

Specimens examined: Near al-Hajer, 6♂, 30♀, many juvs, 14.ii.2005, in Berlese funnel; 2♂, 6♀, 8 juvs, in leaf litter, 28.iii.2005, with Berlese funnel.



Figures 22–30. *Proporcellio* spec. 22–29. Female. 22: Adult specimen, dorsal view; 23: Dorsal scale-seta; 24: Co-ordinates of noduli laterales; 25: Left side of pereionite 1; 26: Cephalon, frontal view; 27: Cephalon, dorsal view; 28: Pleonites 4, 5, telson and uropods; 29: Antennule. 30. Male. Antenna.



Figures 31–37. *Proporcellio* spec., male. 31: Pereiopod 1; 32: Pereiopod 7; 33: Pleopod 1 and genital papilla; 34: Pleopod 2; 35: Pleopod 3 exopod; 36: Pleopod 4 exopod; 37: Pleopod 5 exopod.

Remarks: These specimens are tentatively included in the genus *Proporcellio* since they are characterized by the cephalon with distinct frontal lobes, pereionite 1 with posterior margin straight, not concave at sides, and *Porcellio*-type pleopodal lungs. However, the genus is not well defined and no type species has been designated (see Schmidt & Leistikow, 2004). According to Schmalfuss (2003) it includes 11 species from the Mediterranean area, some of which are not illustrated and of difficult characterization. The whole genus is in need of a revision. The specimens from the UAE do not seem to belong to any of the species of *Proporcellio* so far known, but we prefer not to identify the species due to the above mentioned taxonomic uncertainties. The main characters of the specimens from the Emirates are illustrated in Figures 22–37 to facilitate a future identification.

Genus *Porcellio* Latreille, 1804

Porcellio evansi Omer-Cooper, 1923

Plate 3

Specimens examined: Near Ra's al-Khaimah, 1♂, 10.iii.2005, hand collecting. Ra's al-Khaimah-Dibba, 1♂, 1–30.xi.2008, pitfall traps. Near Tayyibah, 1♂, 10.iii.2005, hand collecting. Wadi Shawkah, 1♀, 5–12.iv.2007, water traps.

Distribution: Southeastern Turkey, northern Syria, Iraq, southwestern Iran, Kuwait, Saudi Arabia, Bahrain, Qatar and Oman. New record for the UAE.

Family Eubelidae

Genus *Periscyphis* Gerstaecker, 1873

Periscyphis vittatus Omer-Cooper, 1926

Specimens examined: 7 km S al-Jazirat al-Hamra, 1♂, 1♀, 4.i.2005, hand collecting. Near Mahafiz, 1♀, 13–18.xii.2005, in pitfall traps. Near Qurraya, 1♀, 16.iii.2005, hand collecting. Ar-Rafah, 13♂, 12♀, 17.xi–14.xii.2009, pitfall traps; 4♂, 5♀, 1–17.xi.2009, pitfall traps; 1♀, 2 juvs, 14–31.xii.2009, pitfall traps; 2♂, 2♀, 1–19.i.2010, pitfall traps; 2♀, 1–11.ii.2010, pitfall traps. Sharjah, 3♂, 4♀, 29.xi.2004, leaf litter in Berlese funnel; 4♂, 1♀, 16.i.2005, in Berlese funnels. Sharjah Desert Park, 7♂, 12♀, 20–23.xi.2004, leaf litter in Berlese funnel; 4♂, 5♀, 6–28.xii.2006, pitfall traps; 2 juvs, 21.i–17.ii.2008, pitfall traps. Um al-Quwain, many ♂ and ♀, 1–30.xi.2008, pitfall traps; 1♂, 1–17.xi.2009, pitfall traps; 1♂, 14–31.xii.2009, pitfall traps; 5♂, 2♀, 1–19.i.2010, pitfall traps.

Distribution: Arabian Peninsula, Socotra Island, Eritrea, Djibouti, Somalia, Mozambique and Pakistan.

Periscyphis fuscocaudatus Taiti & Checcucci **nov. spec.**

Plate 5, Figures 38–58

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Safad, 25°13'N 56°19'E, hand collecting, 5.iii.2005, leg. A. van Harten (MZUF). Paratypes: 1♀, same data as holotype. 1♂, Khor al-Khwair, 15–22.iii.2007, light trap. 1♂, 1♀, near Ra's al-Khaimah, 8.iii.2005, hand collecting. 1♀, Wadi Bih dam, 24.iv–23.v.2007, light trap; 2♀, 6–17.iii.2008, light trap; 1♀, 13–30.iv.2008, light trap; 1♀, 9–29.vi.2008, light trap. 2♂, Wadi Wurayah, 10.iii.2005, hand collecting. OMAN: 1♂, Wadi Halka, Musandam, 25°52'N 56°14'E, 400 m, 18.ii.1999, leg. A.S. Gardner.

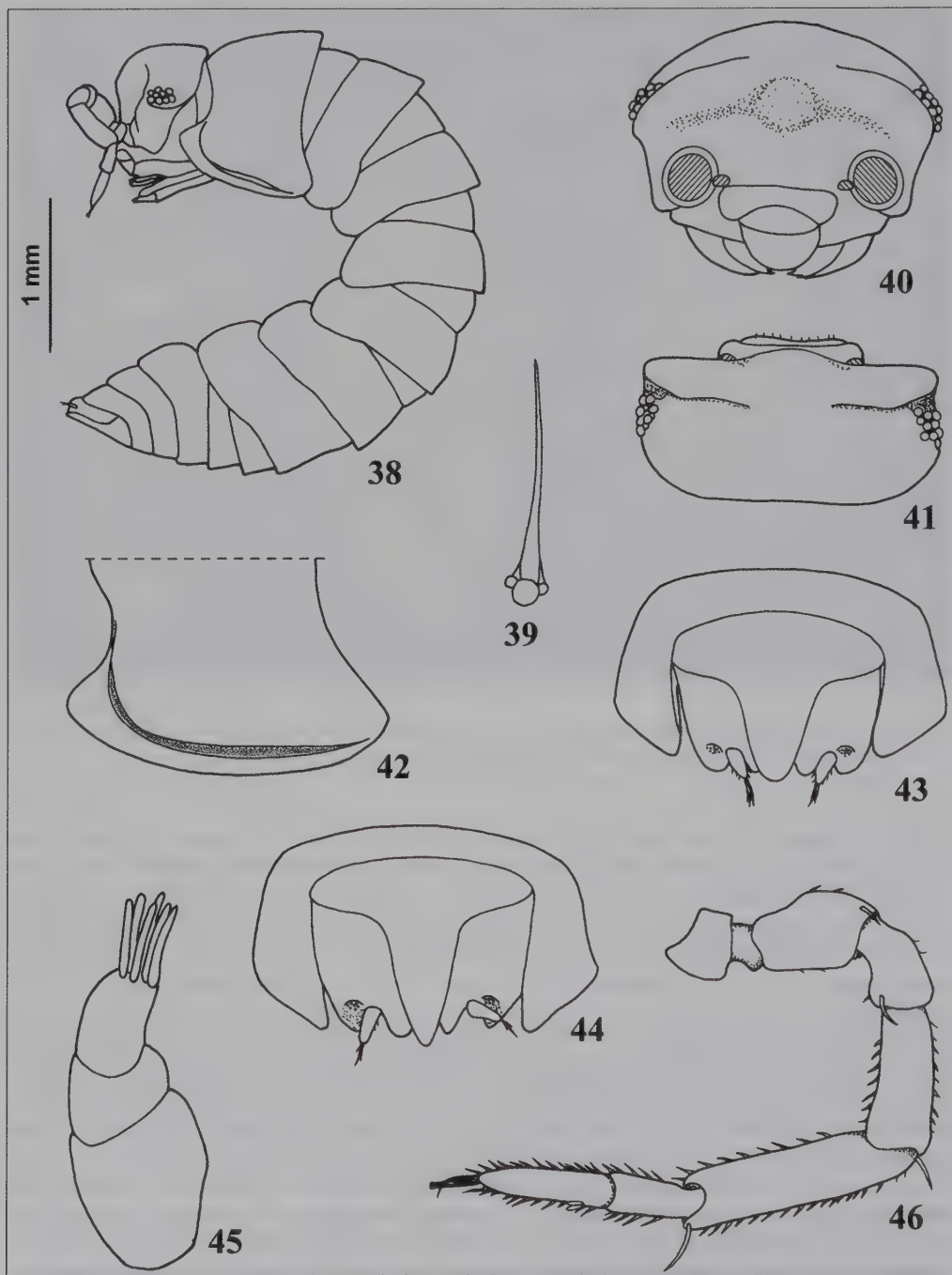
Diagnosis: A species of *Periscyphis* of the *convexus*-group characterized by a cephalon with frontal margin interrupted in the middle, sulcus arcuatus along the whole margin of pereionite 1, male pereopod 7 merus with a triangular lobe on tergal margin, and male pleopod 1 exopod more than twice as wide as long.

Description: Maximum length male 5.5 mm; female 6.5 mm. Body moderately convex with oblique epimera (Fig. 38). Yellowish ground colour with brown profrons, pereionite 1,

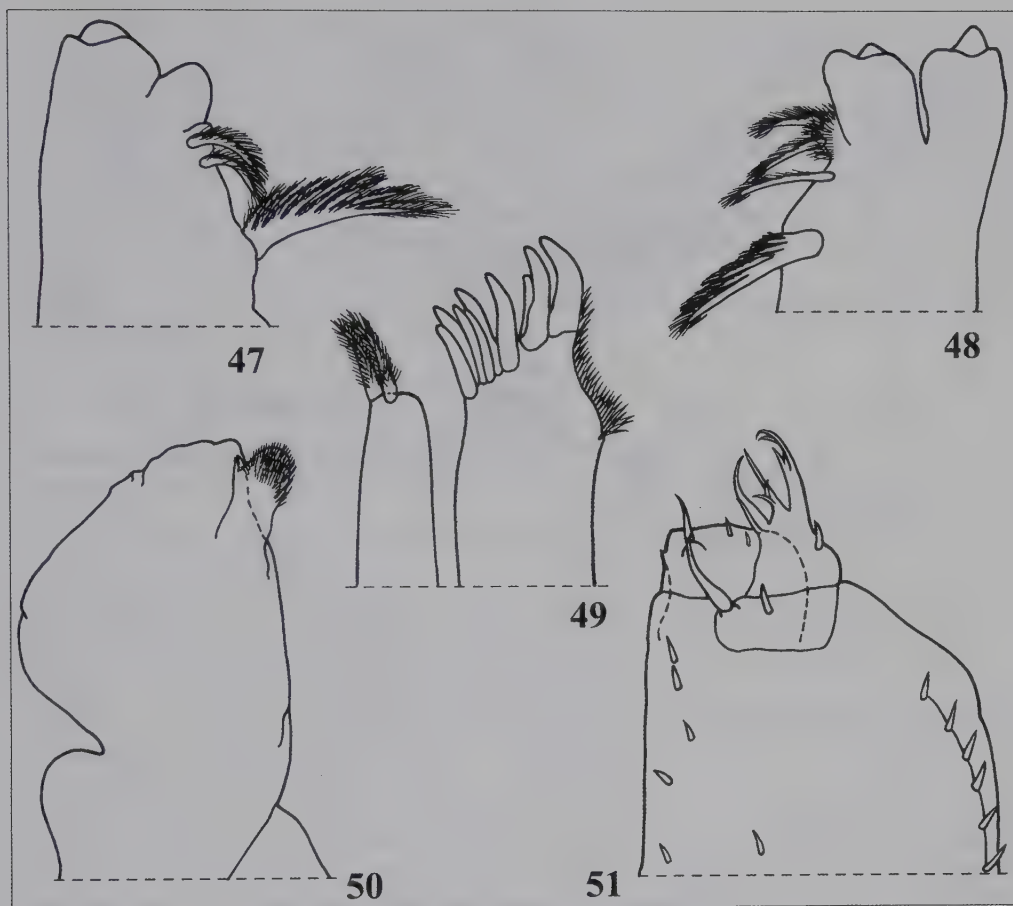


Plates 1-3. 1: *Littorophiloscia strouhali* Taiti & Ferrara, female; 2: *Desertoniscus arabicus* nov. spec., male; 3: *Porcellio evansi* Omer-Cooper, male. Scale-bar = 1 mm.

posterior margins of pereionites 2-7 and sternites of pleonites 1-5; epimera of pereionites 2-7, of pleonites and telson pale. One line of noduli laterales more or less at the same distance from the lateral margin of the pereionites. Some scattered upright setae on dorsum (Fig. 39). Cephalon (Figs 40-41) with profrons slightly protruding frontwards with frontal shield bent over vertex; frontal margin interrupted in the middle; broadly rounded lateral lobes; eyes with about 15 ommatidia. Pereionite 1 (Fig. 42) with lateral margin slightly thickened; a deep sulcus arcuatus along the whole lateral margin, bent medially in the anterior part; posterior margin concave at sides; posterolateral corners narrowly rounded. Telson with distal part triangular, with rounded (specimens from UAE, Fig. 43) or pointed apex (specimen from Oman, Fig. 44). Antennule (Fig. 45) of three articles with apex equipped with some six aesthetascs. Antenna (Fig. 46) with fifth article of peduncle as long as flagellum; second flagellar article about 1.5 times longer than first. Mandible (Figs 47, 48) with semidichotomized molar penicil; 1+1 free penicils on the right mandible and 2+1 on the left. Maxillule (Fig. 49) outer branch with 4+5 simple teeth; inner branch bearing two long penicils. Maxilla (Fig. 50) with a small rounded and setose inner lobe; outer lobe wide, transversally directed and with an indentation on outer margin. Maxilliped as in Figure 51. Only pleopod 1 and 2 exopods with monospiracular *Periscyphis*-type lungs (cf. Ferrara et al., 1997). Uropodal protopod (Fig. 43) subrectangular with rounded posterior corners, indented posterior margin where small exopods are inserted, and a small ovoidal glandular field near exopod insertion.



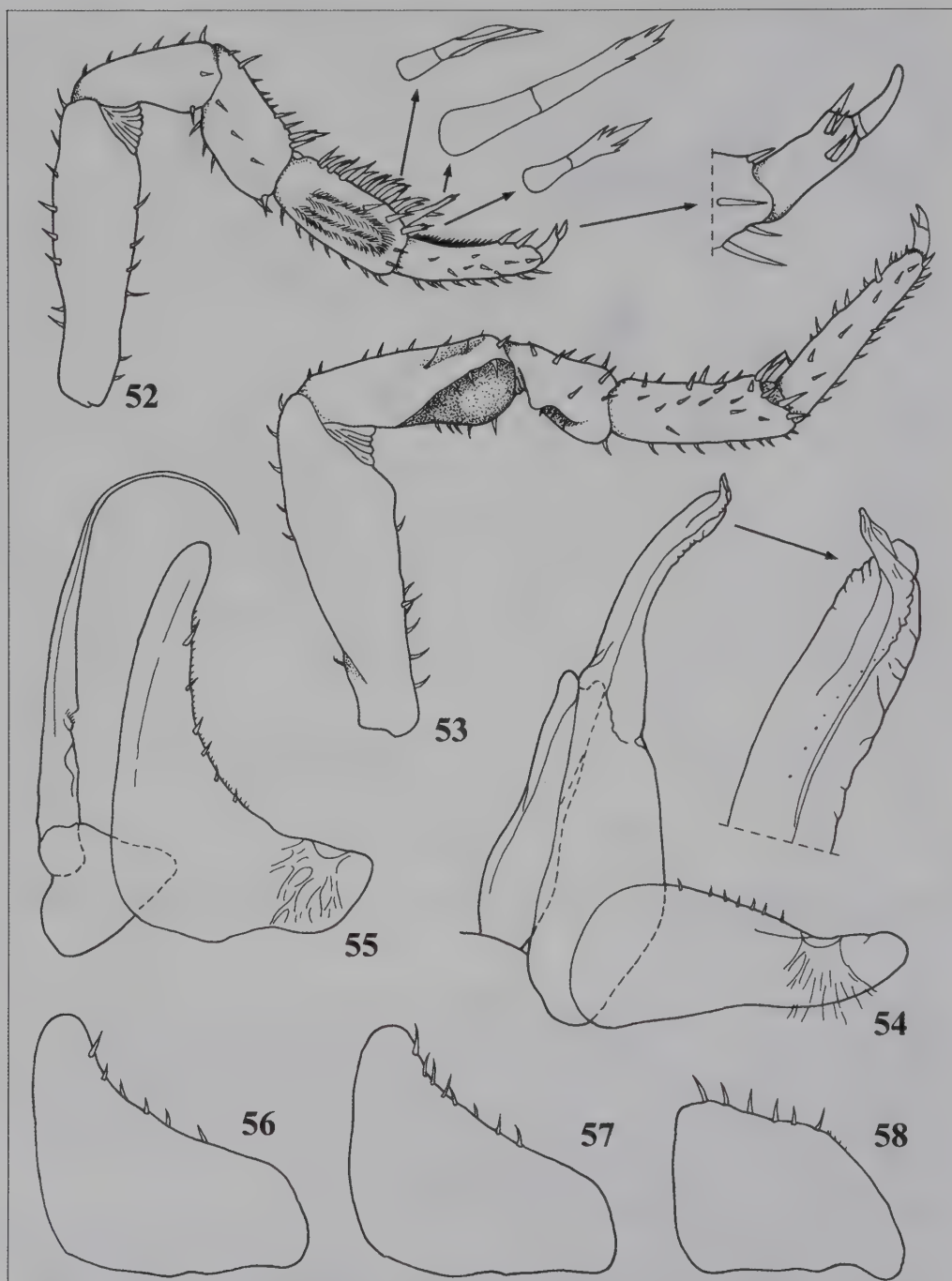
Figures 38–46. *Periscyphis fuscocaudatus* nov. spec., male. 38: Adult specimen, lateral view; 39: Dorsal scale-seta; 40: Cephalon, frontal view; 41: Cephalon, dorsal view; 42: Left side of pereonite 1; 43: Pleonite 5, telson and uropods (specimens from UAE); 44: Pleonite 5, telson and uropods (specimen from Oman); 45: Antennule; 46: Antenna.



Figures 47–51. *Periscyphis fuscocaudatus* nov. spec., male. 47: Right mandible; 48: Left mandible; 49: Maxillule; 50: Maxilla; 51: Maxilliped.

Male: Pereiopods 1–3 carpus with brushes of pointed setae (Fig. 52). Pereiopod 7 (Fig. 53) ischium with straight sternal margin, rostral surface excavated on the distal part; merus with a triangular lobe on the basal half of rostral surface; carpus elongated. Pleopod 1 (Fig. 54) exopod very wide (about 2.5 times as wide as long) with a broadly rounded posterior margin equipped with some setae; endopod with distal part bent outwards and an acute apical lobe directed inwards. Pleopod 2 (Fig. 55) endopod distinctly longer than exopod, with a flagelliform distal part. Pleopod 3–5 exopods as in Figures 56–58.

Remarks: In the shape of cephalon, telson, uropods and male pleopod 1 the new species is close to *Periscyphis laticarpus* Taiti & Ferrara, 1989, from Saudi Arabia and Kuwait, and *P. felix* Taiti & Ferrara, 1989, from Saudi Arabia. It is readily distinguished from both these species in having the sulcus arcuatus bent medially in the anterior part, the male pereiopod 7 merus with a triangular lobe, and the male pleopod 1 endopod with a pointed apical lobe. Other five species of *Periscyphis* show a triangular lobe on the male pereiopod 7 merus,



Figures 52–58. *Periscyphis fuscocaudatus* nov. spec., male. 52: Pereiopod 1; 53: Pereiopod 7; 54: Pleopod 1 and genital papilla; 55: Pleopod 2; 56: Pleopod 3 exopod; 57: Pleopod 4 exopod; 58: Pleopod 5 exopod.

i.e. *P. verhoeffi* Arcangeli, 1929 from Eritrea, Ethiopia and Kenya, *P. merolobatus* Ferrara & Taiti, 1982, from Eritrea, *P. sudanensis* Taiti, Ferrara & Allspach, 1997, from Sudan, *P. insularis* Ferrara & Taiti, 1988, from Oman, and *P. vittatus*. *Periscyphis fuscocaudatus* differs from all these species in the sulcus arcuatus along the entire margin of the pereonite 1, the shape of the uropods and of the male pleopod 1 endopod. It also differs from *P. merolobatus* and *P. vittatus* in lacking the protrusion on the sternal margin of the male pereopod 7 ischium (cf. Fig. 1H in Ferrara & Taiti, 1982, and Fig. 6f in Ferrara & Taiti, 1986); from *P. sudanensis* and *P. insularis* in the shorter male pleopod 1 exopod (cf. Fig. 4C, 4E in Taiti et al., 1997, and Fig. 16 in Ferrara & Taiti, 1988).

Etymology: Latin *fuscus* = dark + *caudatus* = having a tail. The name refers to the brown pleon which stands out from the yellowish ground colour.

Genus *Somalodillo* Taiti & Ferrara, 1982

Somalodillo paeninsulae Ferrara & Taiti, 1986

Specimens examined: N of Ajman, 1♂, 2♀, 16.ix–12.x.2006, water traps; 1♂, 2♀, 21.ix–25.x.2007, water traps.

Distribution: Sudan, Saudi Arabia, UAE, Oman and Yemen (Socotra Archipelago).

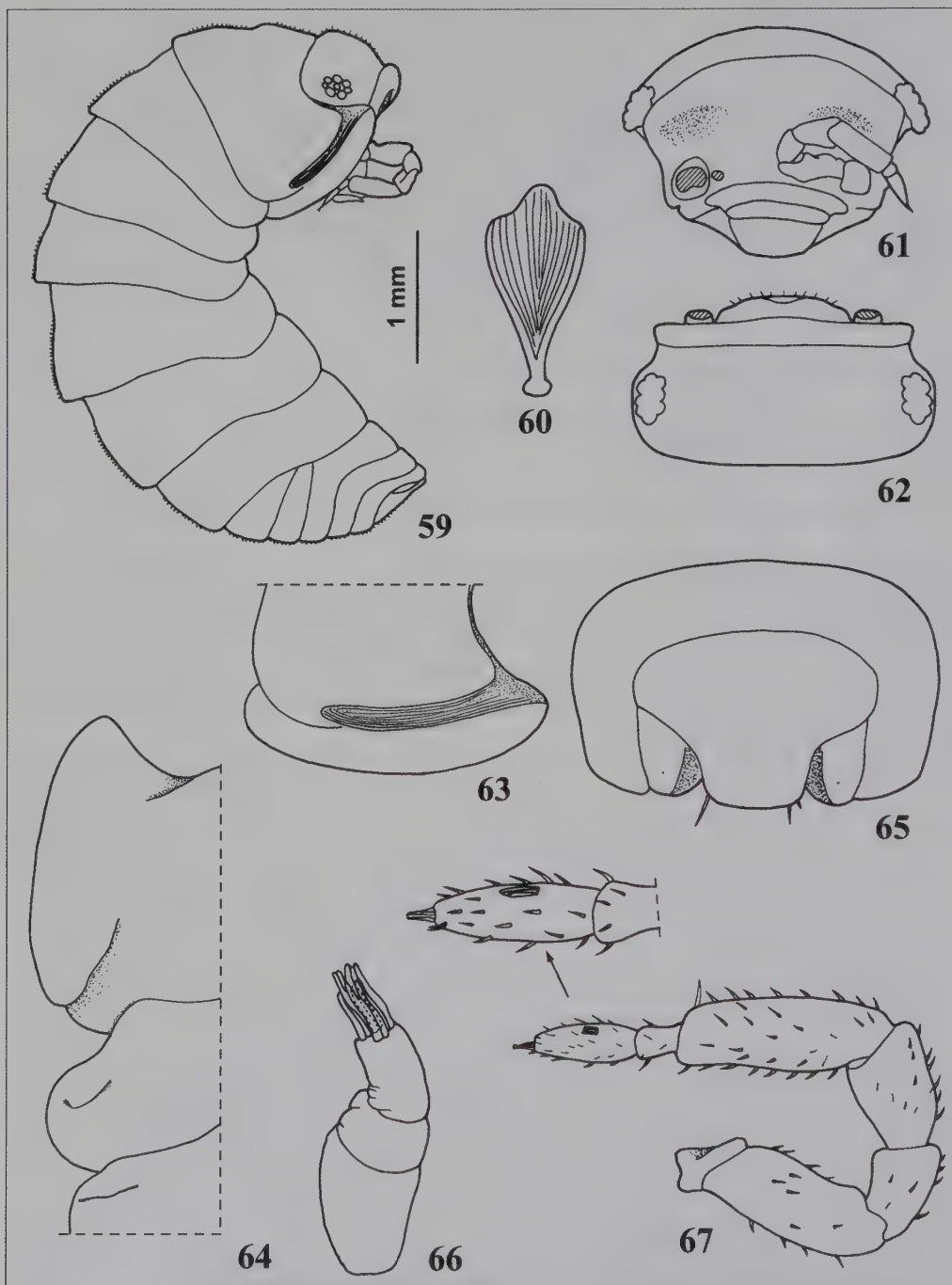
Somalodillo vanharteni Taiti & Checcucci **nov. spec.**

Plate 6, Figures 59–80

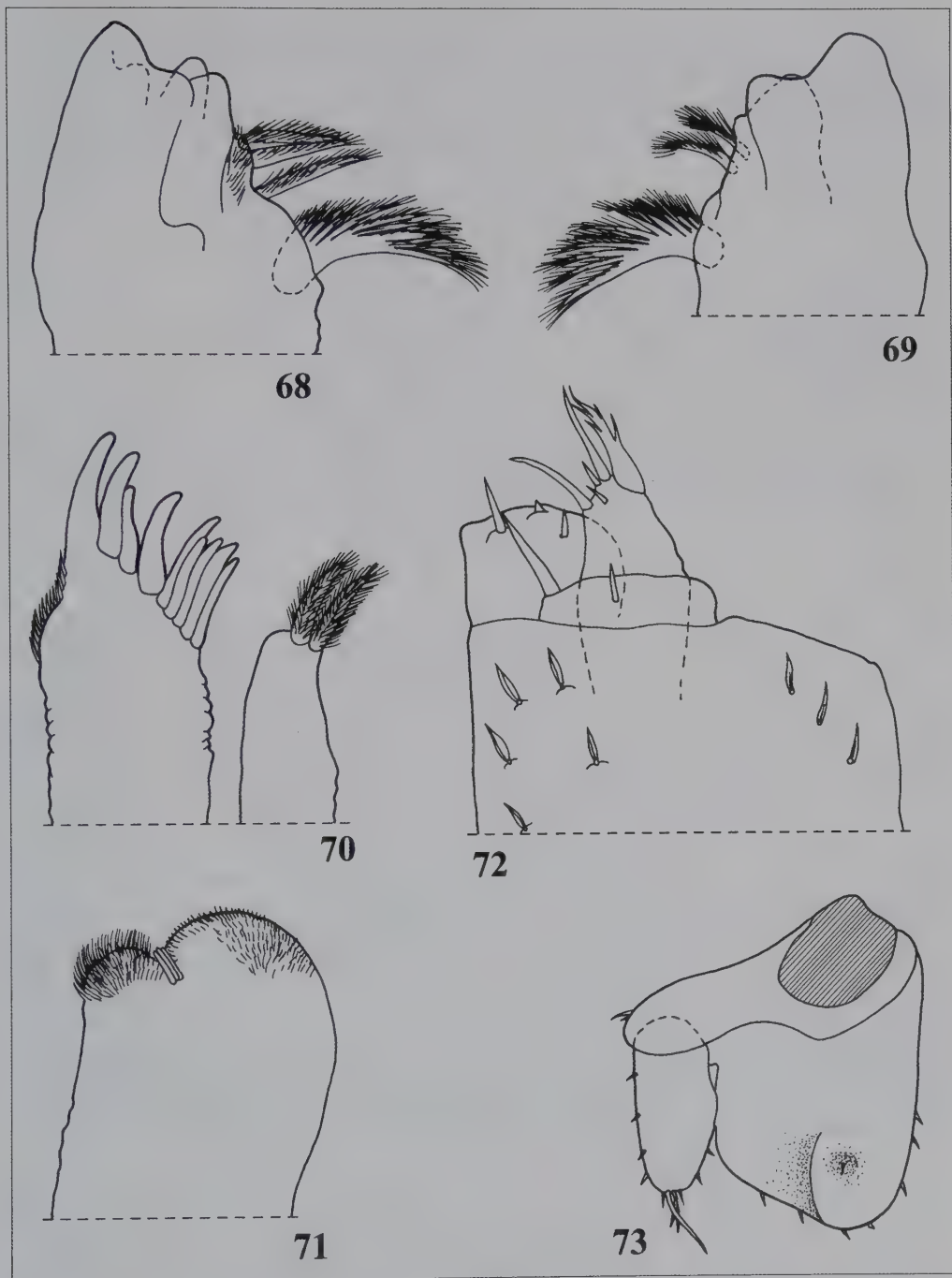
Specimens examined: United Arab Emirates: Holotype: ♂, Sharjah Desert Park, 25°17'N 55°42'E, 6–28.xii.2006, pitfall traps, leg. A. van Harten (MZUF). Paratypes: 7♂, 2♀, same data as holotype. 1♀, al-Ain, near Jebel Hafit, 24°06'N 55°44'E, 21.x–16.xi.2009, pitfall traps.

Diagnosis: A species of *Somalodillo* characterized by spatuliform dorsal scale-setae and pereonite 1 with a wide sulcus arcuatus and marginal thickening, and inner lobe of the schisma not protruding backwards.

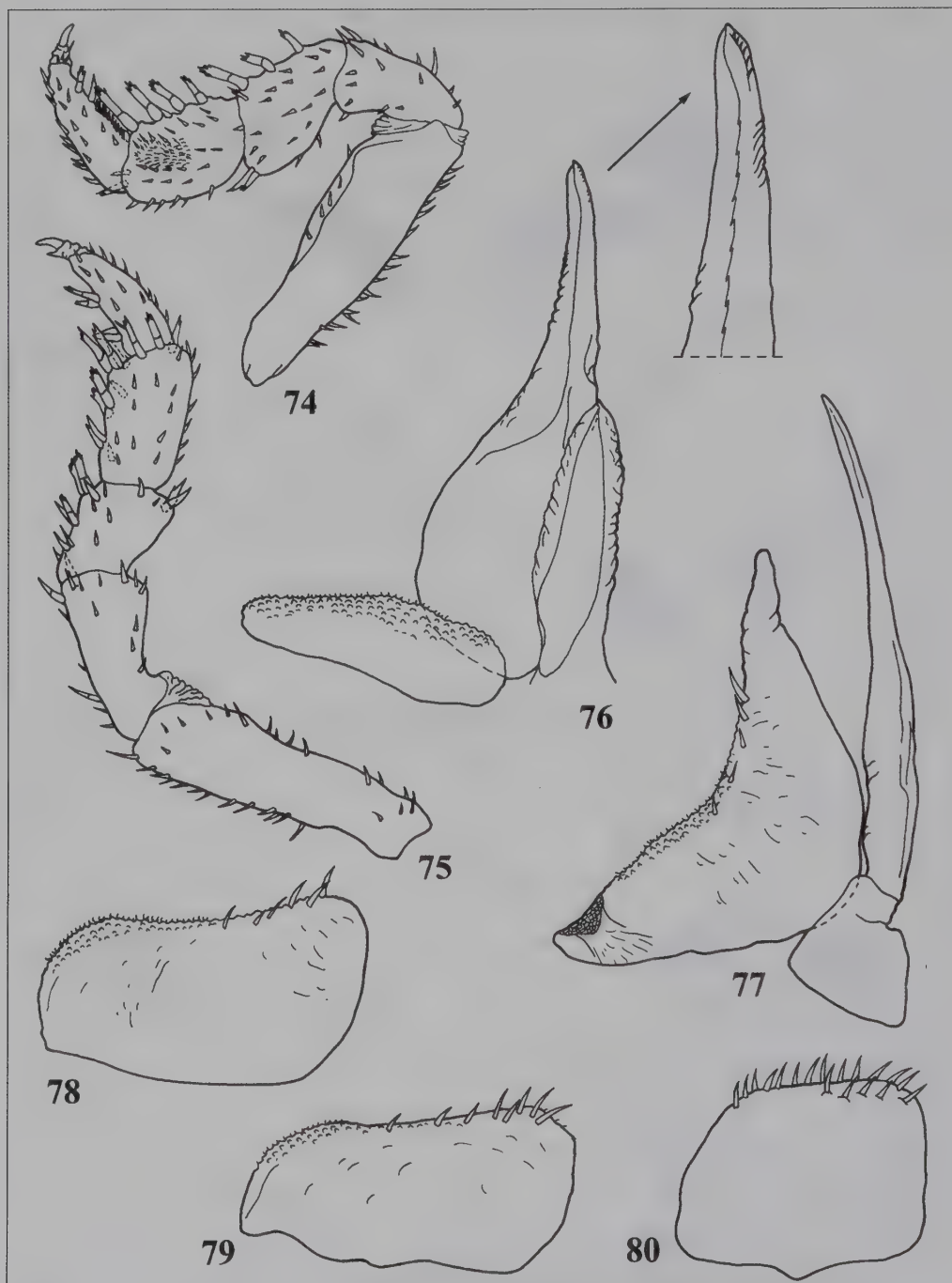
Description: Maximum length male 4.5 mm; female 5.5 mm. Body very convex, with vertical epimera, able to roll up into a perfect ball (Fig. 59). Colour brown with the usual pale muscles spots, epimera pale. Back smooth covered with numerous spatuliform scale-setae (Fig. 60); one line of tiny noduli laterales on pereionites, all at the same distance from the lateral margins. Cephalon (Figs 61, 62) with frontal shield not protruding above vertex from which it is distinctly separated; eyes with 10 ommatidia. Pereonite 1 (Figs 63, 64) with a wide sulcus arcuatus and a wide lateral thickening; posterolateral corner with a schisma, inner and outer lobes rounded and equally protruding backwards; posterior margin straight. Pereonite 2 with a small tooth on ventral surface of epimeron; pereonite 3 with a transversal thickening (Fig. 64). Telson wider than long, with concave lateral margins and truncate apex (Fig. 65). Antennule (Fig. 66) with third article bent outwards and bearing a tuft of long aesthetascs at apex. Antenna short and thickset, with second article of flagellum about twice as long as first and bearing a row of 3–4 aesthetascs (Fig. 67). Mandible (Figs 68, 69) with semidichotomized molar penicil; 1+1 free penicils on the right mandible and 2+1 on the left. Maxillule (Fig. 70) outer branch with 4+5 simple teeth; inner branch bearing two long penicils. Maxilla (Fig. 71) with two rounded and setose distal lobes; outer lobe about twice as wide as inner one; three aesthetascs between the two lobes. Maxilliped as in Figure 72. Pereiopods short and thickset with stout setae on sternal margin. Only pleopod 2 exopod with *Periscyphis*-type lung. Uropod (Fig. 73) trapezoidal; protopod enlarged, about 2/3 as wide as long, depressed in the medial part covered by telson; exopod reduced to a very small seta; endopod short and stout.



Figures 59–67. *Somalodillo vanharteni* nov. spec. 59–66. Female. 59: Adult specimen, lateral view; 60: Dorsal scale-seta; 61: Cephalon, frontal view; 62: Cephalon, dorsal view; 63: Right side of pereonite 1, dorsal view; 64: Right side of pereonites 1–3, ventral view; 65: Pleonite 5, telson and uropods; 66: Antennule. 67. Male. Antenna.



Figures 68–73. *Somalodillo vanharteni* nov. spec., female. 68: Left mandible; 69: Right mandible; 70: Maxillule; 71: Maxilla; 72: Maxilliped; 73: Uropod.



Figures 74–80. *Somalodillo vanharteni* nov. spec., male. 74: Pereiopod 1; 75: Pereiopod 7; 76: Pleopod 1 and genital papilla; 77: Pleopod 2; 78: Pleopod 3 exopod; 79: Pleopod 4 exopod; 80: Pleopod 5 exopod.

Male: Pereiopods (Figs 74, 75) without particular sexual specializations. Pleopod 1 (Fig. 76) exopod very similar to that of the other species, i.e. bean-shaped, about 3 times wider than long, with posterior margin equipped with denticulate scales; endopod with distal part slightly bent outwards, triangular apex. Pleopod 2 (Fig. 77) endopod distinctly longer than exopod; exopod wider than long with some small denticulate scales and a few setae near outer margin. Pleopod 3–5 exopods as in Figures 78–80.

Remarks: At present the genus *Somalodillo* includes three species: *S. squamatus* Taiti & Ferrara, 1982, from Somalia, *S. sulcatus* Taiti & Ferrara, 2004, from Socotra Island, and the above mentioned *S. paeninsulae*. *Somalodillo vanharteni* differs from all the other species in having a wider sulcus arcuatus and lateral thickening on the pereionite 1; from *S. squamatus* also in the rounded instead of triangular inner lobe of the schisma on the pereionite 1, and wider uropodal protopod (cf. Figs 5, 6 and 10 in Taiti & Ferrara, 1982); from *S. sulcatus* in lacking the grooves on the cephalon and the lateral margins of pereionite 1 (cf. Figs. 52c–e in Taiti & Ferrara, 2004); from *S. paeninsulae* in the spatuliform instead of claviform dorsal scale-setae (cf. Fig. 14b in Ferrara & Taiti, 1986), and triangular instead of rounded apical part of the male pleopod 1 endopod (cf. Fig. 4c in Taiti & Ferrara, 1989).

Etymology: The new species is named after Mr. A. van Harten, coordinator of the UAE Insect Project, who collected most of the specimens included in this study.

Genus *Koweitoniscus* Vandel, 1975

Koweitoniscus korshunovi Taiti & Checcucci **nov. spec.**

Plate 7, Figures 81–102

Specimens examined: United Arab Emirates: Holotype ♂, al-Ain, near Jebel Hafit, 24°06'N 55°44'E, 21.x–16.xi.2009, pitfall traps, leg. V. Korshunov (MZUF). Paratypes: 5♂, 8♀, 3 juvs, same data as holotype. 1♂, 1♀, ar-Rafah, 17.xi–14.xii.2009, pitfall traps.

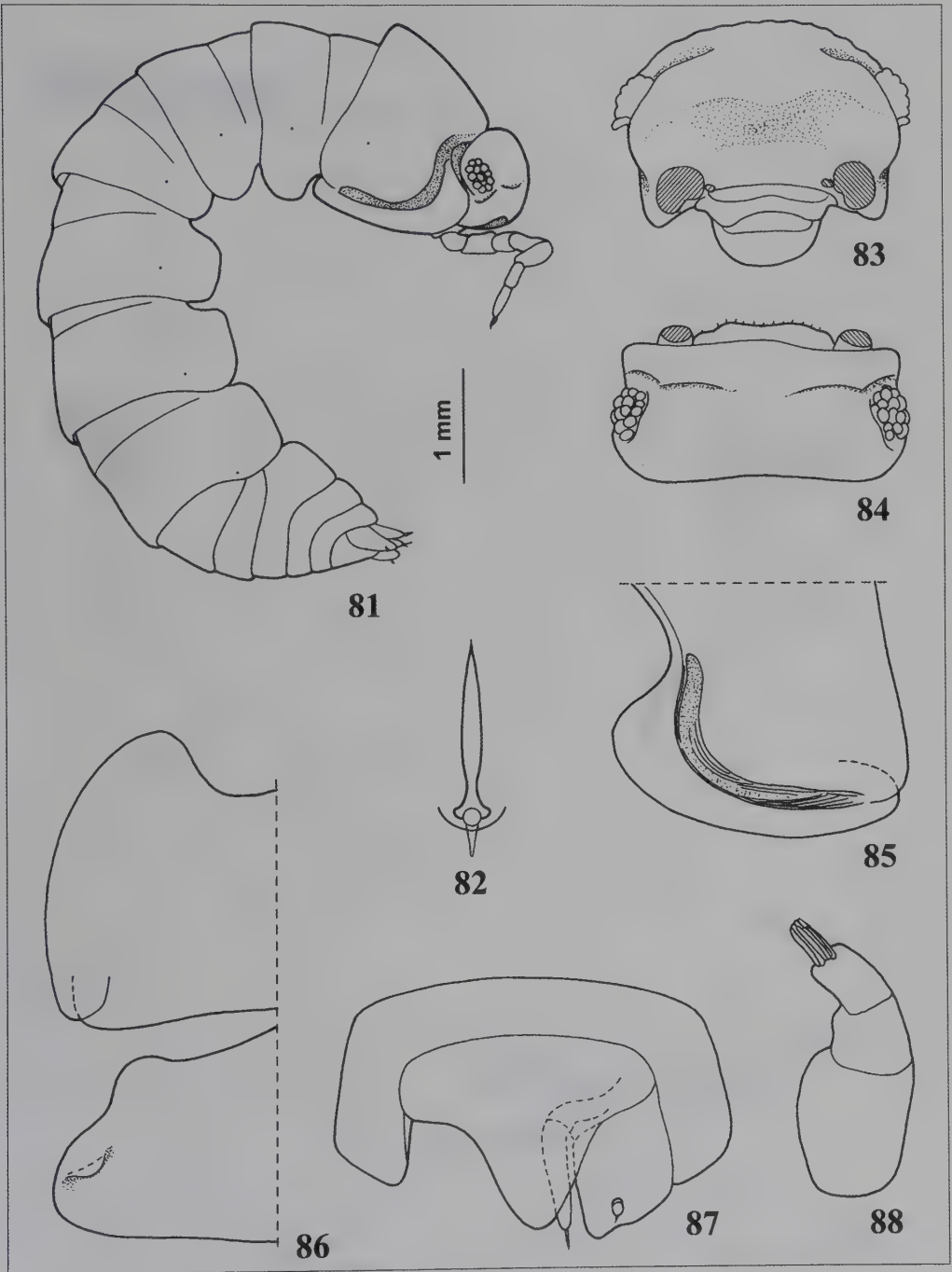
Diagnosis: A species of *Koweitoniscus* characterized by the cephalon with frontal margin interrupted in the middle, pereionite 1 with wide sulcus arcuatus, uropodal exopod inserted on dorsal surface of protopod, male pereiopod 7 ischium narrow with concave sternal margin, and male pleopod 1 endopod with distal part sinuous and apically enlarged.

Description: Maximum length male 5.5 mm; female 6.5 mm. Pale colour. Body very convex, with vertical epimera, able to roll up into a perfect ball (Fig. 81). Dorsum with small lanceolate scale-setae (Fig. 82). One line of small noduli laterales per side at the same distance from the lateral margins of the pereionites. Cephalon (Figs 83, 84) with frontal shield bent and not protruding over vertex, frontal margin broadly interrupted in the middle, lateral lobes rounded; eyes with 14–15 ommatidia. Pereionite 1 (Figs 85, 86) with a wide sulcus arcuatus, the anterior part of which bends towards the middle part of the body; lateral margin slightly thickened; posterior margin straight; inner and outer lobes of schisma rounded, not protruding backwards. Pereionite 2 (Fig. 86) with a small rounded ventral lobe; pereionite 3 with a transverse thickening. Telson (Fig. 87) about 1.5 times as wide as long, with concave sides and distal part triangular with rounded apex. Antennule (Fig. 88) with third article bent outwards and bearing a tuft of long aesthetascs at apex. Antenna (Fig. 89) with fifth article of peduncle longer than flagellum; second article of flagellum about 1.5 times as long as second. Mandible (Figs 90, 91) with semidichotomized molar penicil; 1+1 free penicils on the right mandible and 2+1 on the left. Maxillule (Fig. 92) outer branch with 4+5 simple teeth; inner branch bearing two long penicils. Maxilla (Fig. 93) with rounded and setose inner lobe; outer lobe wide, transversally directed and with an indentation on outer margin; three aesthetascs between the two lobes. Maxilliped as in Figure 95. Pleopod 1–2 exopod with monospiracular covered lungs. Uropod (Fig. 95) with protopod subquadrangular, posterior margin slightly

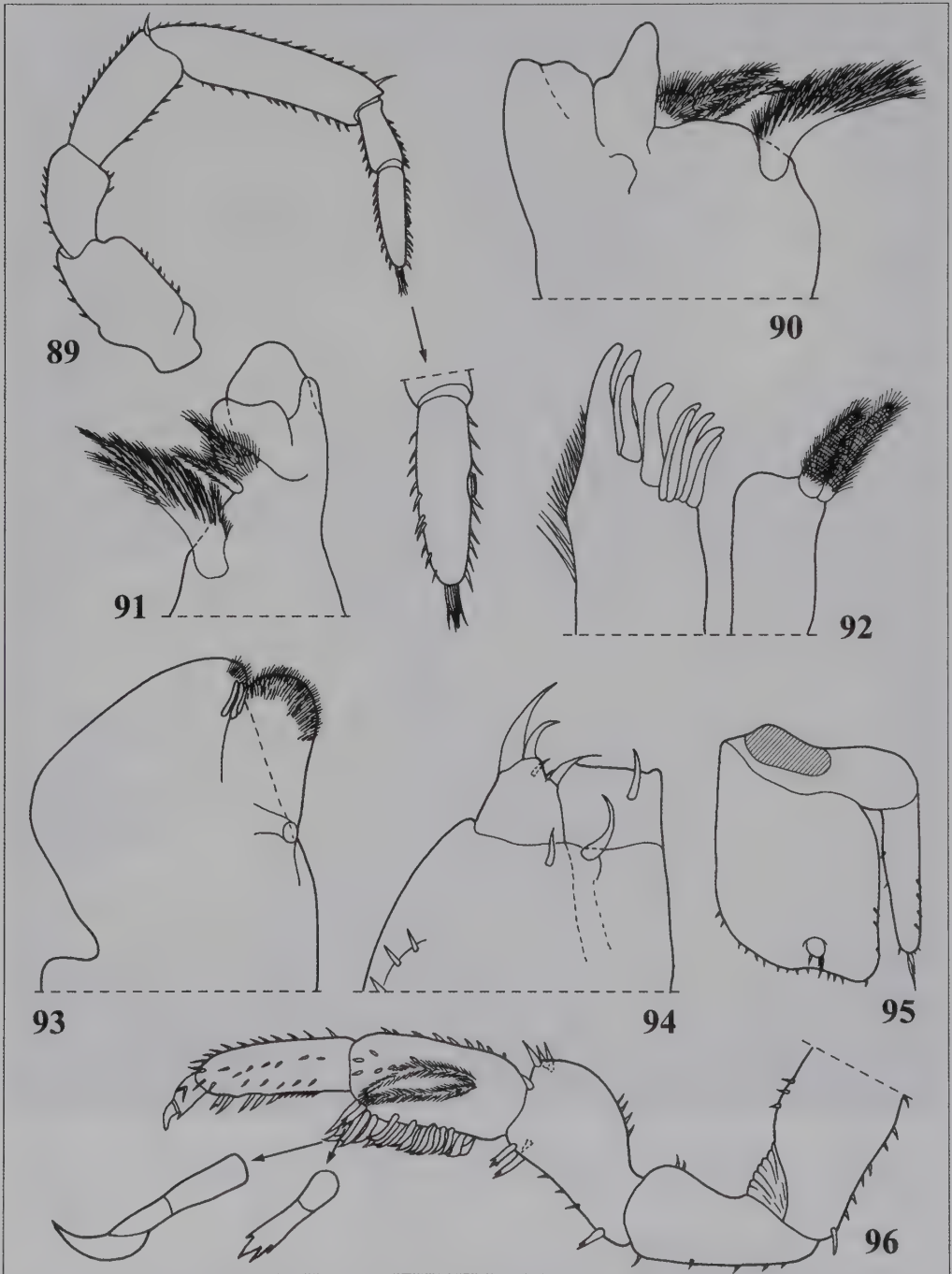


Plates 4-7. 4: *Tylos maindroni* Giordani Soika, male; 5: *Periscyphis fuscocaudatus* nov. spec., female; 6: *Somalodillo vanharteni* nov. spec., female; 7: *Koweitoniscus korshunovi* nov. spec., male. Scale-bar = 1 mm.

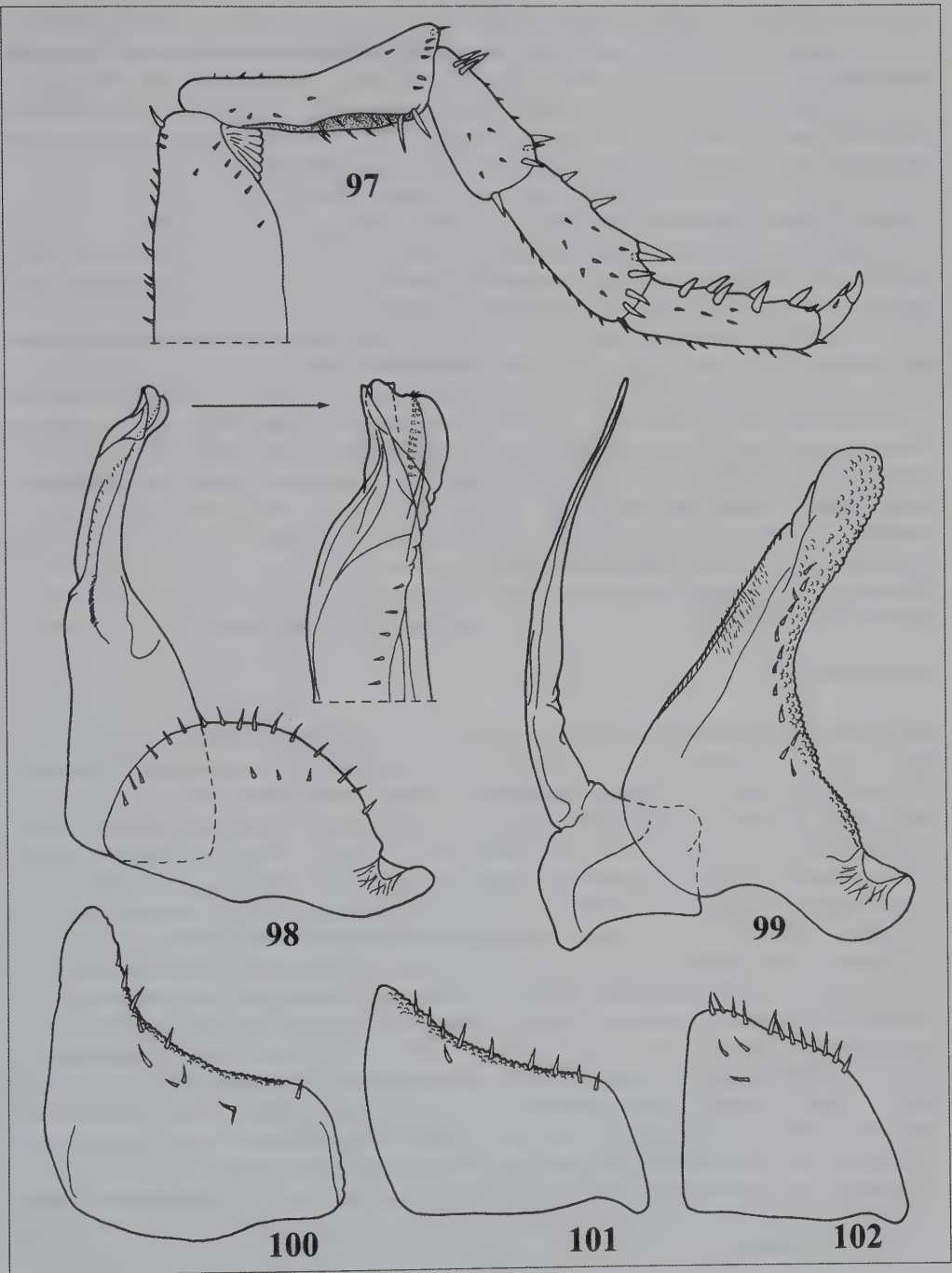
sinuose but not indented; exopod minute inserted dorsally near the posterior margin; endopod long and thin, almost reaching distal margin of protopod.



Figures 81–88. *Koweitoniscus korshunovi* nov. spec., female. 81: Adult specimen, lateral view; 82: Dorsal scale-seta; 83: Cephalon, frontal view; 84: Cephalon, dorsal view; 85: Left side of pereonite 1, dorsal view; 86: Right side of pereonites 1, 2, ventral view; 87: Pleonite 5, telson and right uropod; 88: Antennule.



Figures 89–96. *Koweitoniscus korshunovi* nov. spec., male. 89: Antenna. 90: Left mandible; 91: Right mandible; 92: Maxillule; 93: Maxilla; 94: Maxilliped; 95: Uropod; 96: Pereopod 1.



Figures 97–102. *Koweitoniscus korshunovi* nov. spec., male. 97: Pereiopod 7; 98: Pleopod 1 and genital papilla; 99: Pleopod 2; 100: Pleopod 3 exopod; 101: Pleopod 4 exopod; 102: Pleopod 5 exopod.

Male: Pereiopod 1–3 carpus with a brush of pointed setae (Fig. 96). Pereiopod 7 (Fig. 97) ischium narrow with concave sternal margin; merus and carpus elongated, without distinct specializations. Pleopod 1 (Fig. 98) exopod wide and short, with widely rounded posterior margin equipped with a row of pointed setae; endopod with distal part stout and sinuous, with a rounded lobe on outer margin of apex. Pleopod 2 (Fig. 99) with endopod slightly longer than exopod; exopod much longer than wide with numerous small scales and a line of setae near the outer margin. Pleopod 3–5 exopods as in Figures 100–102.

Remarks: Three species are presently included in the genus *Koweitoniscus*: *K. tamei* (Omer-Cooper, 1923) from Syria, Iraq and Kuwait, *K. rostratus* Ferrara & Taiti, 1986, from southwestern Saudi Arabia, and *K. vanharteni* Ferrara & Taiti, 1996, from Yemen. In the cephalon with frontal margin interrupted in the middle the new species is morphologically similar to the type-species *K. tamei*, from which it differs in having the sulcus arcuatus more bent upwards, thinner male pereiopod 7 ischium and merus, and apex of the male pleopod 1 endopod with a wide rounded lobe on outer margin (cf. Figs 15c, e, g in Ferrara & Taiti, 1986). *Koweitoniscus korshunovi* is readily distinguishable from both *K. rostratus* and *K. vanharteni* in having an interrupted instead of continuous frontal margin on the cephalon, and the uropodal distal margin not incised; from the former also in the male pereiopod 7 merus without a triangular lobe (cf. Fig. 16f in Ferrara & Taiti, 1986), and from the latter in the male pereiopod 7 carpus not enlarged and without a triangular process on the distal margin (cf. Figs 5h, i in Taiti & Ferrara, 1996).

Etymology: The species is named after Dr. V. Korshunov, zoologist at the Management of Nature Conservation, Al-Ain, UAE, who collected part of the specimens.

DISCUSSION

With the four new species and the 10 new records the oniscidean fauna of the UAE increases from four to 18 species: *Ligia persica*, *Tylos maindroni*, *Littorophiloscia strouhali*, *Littorophiloscia* spec., *Platyarthrus aiasensis*, *Agnara madagascariensis*, *A. gallagheri*, *Desertoniscus arabicus* Taiti & Checcucci nov. spec., *Porcellionides pruinusos*, *Agabiformius lentus*, *A. obtusus*, *Proporcellio* spec., *Porcellio evansi*, *Periscyphis vittatus*, *P. fuscocaudatus* Taiti & Checcucci nov. spec., *Somalodillo paeninsulae*, *S. vanharteni* Taiti & Checcucci nov. spec. and *Koweitoniscus korshunovi* Taiti & Checcucci nov. spec.

The oniscidean fauna of the Emirates consists of a group of marine littoral species (*Ligia pigmentata*, *Tylos maindroni*, *Littorophiloscia strouhali*, *Littorophiloscia* spec.) with wide distributions in the area, a large group of introduced species of both Palaearctic and Afrotropical origin (*Platyarthrus aiasensis*, *Agnara madagascariensis*, *Porcellionides pruinusos*, *Agabiformius lentus*, *A. obtusus*, and most probably also *Desertoniscus arabicus*, *Agnara gallagheri*, *Porcellio evansi*, *Periscyphis vittatus* and *Somalodillo paeninsulae*), and a group of native species in the family Eubelidae (*Periscyphis fuscocaudatus*, *Somalodillo vanharteni* and *Koweitoniscus korshunovi*). *Somalodillo vanharteni* and *Koweitoniscus korshunovi* seem to be endemic to UAE, while *Periscyphis fuscocaudatus* is known also for the northern part of Oman (Musandam). As in the rest of the Arabian Peninsula, the presence of endemic species of Eubelidae confirms the Afrotropical origin of part of the oniscidean fauna of the Emirates.

ACKNOWLEDGEMENTS

We wish to express our sincerest thanks to Mr. Antonius van Harten for the chance to study such an interesting collection of Oniscidea from the United Arab Emirates, and to Dr.

Andrew S. Gardner (Zayed University, Abu Dhabi) who collected a specimen of the new species of *Periscyphis* in northern Oman.

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Authors' addresses:

S. Taiti & I. Checcucci, Istituto per lo Studio degli Ecosistemi, Consiglio Nazionale delle Ricerche, Via Madonna del Piano 10, 50019 Sesto Fiorentino (Firenze), Italy; e-mail: stefano.taiti@ise.cnr.it and Cheila@hotmail.com

Order Neuroptera, family Ascalaphidae

György Sziráki

INTRODUCTION

Hitherto 11 species of Ascalaphidae, also known as 'owl-flies', have been recorded from the Arabian Peninsula (Hölzel, 2004); at that moment only a single species (*Ptyngidricerus venustus* Tjeder & Waterston, 1977) from the United Arab Emirates was listed. Howarth and Aspinall (2002) recorded *Bubopsis hamata* Klug, 1834, and Gillett & Howarth (2004) listed *Ascalaphus* spec. from Jebel Hafit. M. Gillett & C. Gillett (2005) stated four species of Ascalaphidae were known from the UAE, but in the publication referred to by them (Gillett, 1999) only an unidentified species really from the territory of the UAE is mentioned, the others being from Oman. In the present paper five species from two subfamilies are recorded. As the sexual dimorphism, as well as the intraspecific variability may be considerable, the characteristic taxonomic features are given in a somewhat detailed form instead of a very short diagnosis.

MATERIALS AND METHODS

All examined specimens were collected in the UAE by Antonius van Harten, unless otherwise stated. The owl-flies were caught mainly with light traps which were operated in different parts of the country. The examined material is divided between UAE Invertebrate Collection and the collection of the Hungarian Natural History Museum.

Abbreviations used in the text: AL = at light; AvH = Antonius van Harten; KS = K. Szpila; LT = light trap; MT = Malaise trap; TP = T. Pape; WT = water trap.

SYSTEMATIC ACCOUNT

Subfamily **Haplogleniinae** Newman, 1853
(Eyes entire, not divided by a horizontal sulcus.)

Ptyngidricerus venustus Tjeder & Waterston, 1977

Plates 1–2

Specimens examined: Al-Ajban, 1♂, 25.ii–27.iii.2006, LT. Sharjah-Khor Kalba, near tunnel, 4♂, 2♀, 7–22.iii.2006, LT. Wadi Bih dam, 1♂, 15–22.iii.2007, LT; 1♀, 24.iv–1.v.2007, LT; 1♀, 7–13.v.2007; 1♂, 5♀, 21–30.iv.2008, LT. Wadi Madaq, 6♂, 18♀, 18.iv.2005, AL & LT, leg. AvH, TP & KS; 1♂, 4♀, 27.iv–4.v.2006, LT. Wadi Safad, 2♀, 14–21.v.2006, LT. Wadi Wurayah, 5♂, 6♀, 12–14.iv.2005, MT+WT, leg. TP.

Characteristic features: Large species; length of the body and wings about 30 mm (fore wings slightly longer than hind wings or body). Length of antennae 20–22 mm. Wing pattern is rather characteristic, there is a broad dark band and a small dark spot on both wings distally. Other parts of wing membrane of male rather dark brown, of female almost hyaline, but the subcostal area in both sexes light brown. Pterostigma hyaline.

Distribution: UAE and Oman. Data from territories outside the Arabian Peninsula are questionable (Hölzel, 2004).

Subfamily **Ascalaphinae** Lefèbvre, 1842

(Eyes horizontally divided into two regions by a transverse sulcus)



Plates 1–2. *Ptyngidricerus venustus* Tjeder & Waterston. 1: Male; 2: Female. (Photographs by Imre Retezár)

***Ascalaphus festivus* (Rambur, 1842)**

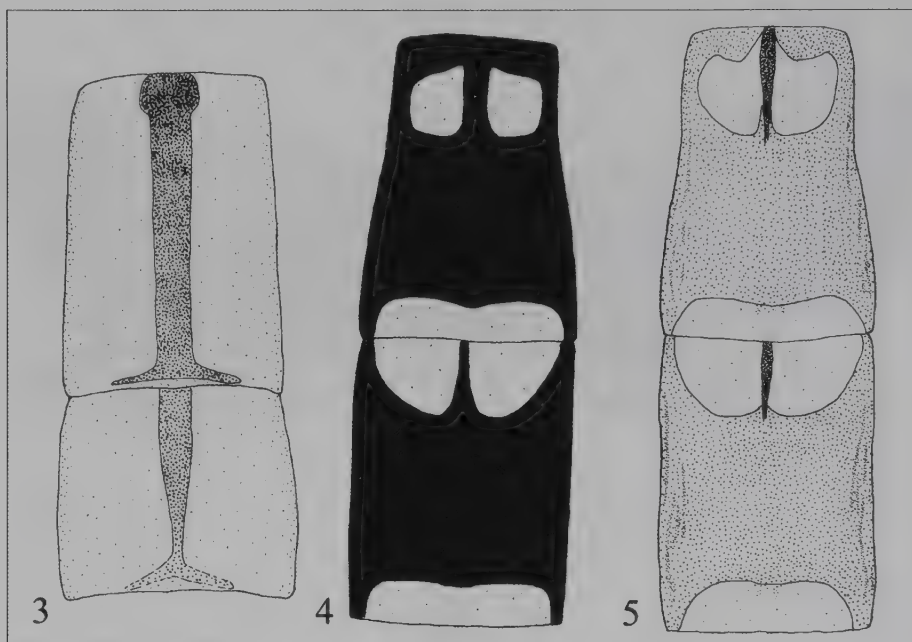
Figures 1–3

Specimens examined: Fujairah, 1♂, 17–24.vii.2005, LT; 2♀, 28.ii–1.iv.2006, LT; 2♀, 1–8.iv.2006, LT. Hatta, 1♂, 19–28.iii.2006, LT; 4♂, 2♀, 4–11.iv.2006, LT; 2♂, 4♀, 8–26.iv.2006, LT; 1♂, 24–30.v.2006, LT. Sharjah Desert Park, 1♀, 21–29.iii.2005, LT; 1♀, 6–30.iv.2008, LT. Wadi Bih dam, 1♀, 21–30.iv.2008, LT. Wadi Madaq, 1♂, 1♀, 27.iv–4.v.2006, LT. Wadi Safad, 1♂, 21.ii–4.iii.2006, LT; 1♂, 2♀, 15–22.iv.2006, LT.

Characteristic features: Length of the body and fore wing usually somewhat shorter than 30 mm, but with rather large variability. Length of antennae 21–24 mm. Wing membrane



Figures 1–2. *Ascalaphus festivus* Rambur. 1: Male; 2: Female. (Drawings by János Pál)



Figures 3–5. 3: *Ascalaphus festivus* Rambur, female, abdominal sternites 3–4; 4: *Aspoeckiella gallagheri* Hölzel, female, abdominal tergites 3–4 (dark specimen); 5: *Aspoeckiella gallagheri* Hölzel, female, abdominal tergites 3–4 (light specimen).

hyaline. There is a hair tuft on male forewing at the base of the costal margin. Thorax medially yellow or brownish-yellow. Abdomen dorsally with a yellow or ochreous strip. This strip includes small dark spots in male, and bordered laterally by dark lines which are straight in male and zigzaggy in female. Pleurites of female with yellow, white and grey patterns, while those of male usually without characteristic pattern. Abdominal sternites 3–7 yellow or ochreous with dark median strip (shortening and narrowing backwards), and with a caudal transverse line on one or more anterior segments (Fig. 3). Females usually are much more colourful than males. Male ectoproct short.

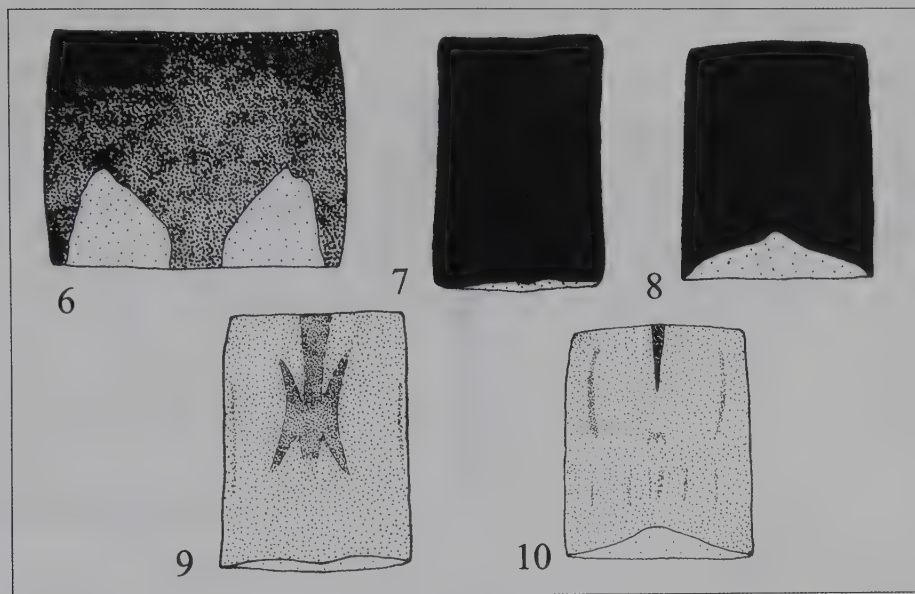
Distribution: Cape Verde Islands, Senegal, Tunisia, Israel, Saudi Arabia, Yemen, Oman. New to the UAE.

Aspoeckiella gallagheri Hölzel, 2004

Plate 3, Figures 4–5

Specimens examined: Khor al-Khwair, 1♀, 17–24.iv.2007, LT. Near Mahafiz, 1♀, 21–28.viii.2006, LT. Sharjah-Khor Kalba, near runnel, 2♀, 24–30.v.2006, LT; 1♂, 3♀, 31.v–7.vi.2006, LT; 1♀, 7–14.vi.2006, LT. Wadi Bih dam, 1♂, 2♀, 7–13.v.2007, LT; 4♂, 2♀, 30.v–5.vi.2007, LT; 10♂, 13♀, 30.iv–4.vi.2008, LT; 2♂, 2♀, 4–9.vi.2008, LT. Wadi Safad, 1♂, 14–21.v.2006, LT; 1♂, 17–24.vi.2006, LT.

Characteristic features: The measurements are highly variable: length of fore wing 23–30 mm, of body 19–27 mm, of antennae 15–23 mm. Pterostigma dark brown, otherwise, wing membrane of male entirely, of female mostly hyaline. In the latter sex subcostal and costal area (at least partly) dark brown, while the distal tip of the hind wing brownish. Abdominal tergites 3–7 black, with light spots as in Figure 4, however, in lighter specimens



Figures 6–10. 6: *Bubopsis zarudnyi* Alexandrova-Martynova, male, abdominal tergite 3; 7: *Tytomyia arabica* Hölzel, female, abdominal tergite 4 (dark specimen); 8: *Tytomyia arabica* Hölzel, female, abdominal sternite 4 (dark specimen); 9: *Tytomyia arabica* Hölzel, female, abdominal tergite 4 (light specimen); 10: *Tytomyia arabica* Hölzel, female, abdominal sternite 4 (light specimen).

medium brown with light spots and with a median dark brown line (Fig. 5). Sternites dark brown, with light transverse caudal strip. (The white colour is more extensive in males than in females.) Male ectoproct long.

Distribution: Oman. New to the UAE.

***Bubopsis zarudnyi* Alexandrova-Martynova, 1926**

Plate 4, Figure 6

Specimens examined: Khor al-Khwair, 2♂, 24.iv–1.v.2007, LT. Wadi Bih dam, 1♀, 7–13.v.2007, LT. Wadi Safad, 1♀, 15–22.iv.2006, LT; 1♀, 14–21.v.2006, LT.

Characteristic features: Moderately large owl fly; length of the body 20–25 mm, fore wing 25–30 mm, antennae, 20 mm. Wing membrane mostly fuscous, but distal part of hind wing brown and gradually darkened (in female darker than in male). Besides, Sc area of female also brown. Tergites of abdomen blackish brown, with a pair of pale ochreous posterior spots (Fig. 6). Most of the sternites dark brown, usually with some light margin. Last pregenital sternite with a pair of light strips between the median and lateral dark patterns. Male ectoproct long, with a large submedian projection.

Distribution: Iran and Oman. New to the UAE.

***Tytomyia arabica* Hölzel, 2004**

Plate 5, Figures 7–10

Specimens examined: Hatta, 1♂, 1♀, 24–30.v.2006, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 1♀, 24–30.v.2006, LT; 1♂, 31.v–7.vi.2006, LT. Wadi Bih dam, 11♀, 30.v–5.vi.2007, LT; 1♂, 30.iv–4.vi.2008, LT; 1♂, 4–9.vi.2008, LT; 1♂, 2♀, 9–29.vi.2008, LT; 2♂, 1♀, 9–23.vii.2008, LT. Wadi Madaq, 3♂, 2♀, 27.iv–4.v.2006, LT; 2♀, 1–8.vii.2006, LT. Wadi Safad, 3♂, 4♀, 17–24.vi.2006, LT.



Plates 3–4. 3: *Aspoeckiella gallagheri* Hölzel, male; 4: *Bubopsis zarudnyi* Alexandrova-Martynova, female. (Photographs by Imre Retezár)

Characteristic features: A smaller ascalaphid species; regarding the examined material, the length of the body 18–22 mm, of fore wings 20–26 mm, of antennae 15–18 mm. (According to the original description, the body and antennae may be shorter (Hölzel, 2004)). Wing membrane hyaline, pterostigma from light to dark brown. Tergites and sternites of the abdomen usually black, with a narrow posterior margin on the segments 3–7. This margin is somewhat wider in the segments 4 (Figs 7–10) and 6. In males often dark brown colour is instead of black on the sternites. Moreover, the original colour of sternites often is lost in the male specimens preserved in alcohol. Besides, there are pale specimens in both sexes with ochreous ground colour both on tergites and sternites. In these cases some patterns (Figs 9–10) are visible, which otherwise are covered by black or dark brown colour. Male ectoproct short. Distribution: Oman and Yemen. New to the UAE.



Plate 5: *Tytomyia arabica* Hölzel, female. (Photograph by Imre Retezár)

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Author's address:

Dr. Gy. Sziráki, Hungarian Natural History Museum, Department of Zoology, Baross utca 13, 1088 Budapest, Hungary; e-mail: sziraki@zoo.zoo.nhmus.hu

Order Neuroptera, family Nemopteridae

György Sziráki

INTRODUCTION

Thirty years ago 10 species were dealt with in the first special paper on the Nemopteridae of the Arabian Peninsula (Meinander, 1980). This number was enlarged only to 12 by Hölzel (1999), with the description of two species new to the science, but none of them was reported from the territory of the United Arab Emirates. The first nemopterid mentioned undoubtedly from this country was *Halter halteratus* (Forskål, 1775) as being present in the Neuroptera collections of the National Museums of Scotland (Whittington, 2002). The same species was recorded from Dubai by M. Gillett & C. Gillett (2005). Gillett & Howarth (2004) listed *Dielocroce elegans* Alexandrov-Martynov, 1930, from Jebel Hafit and Howarth & Gillett (2007) listed *Dielocroce ephemera* (Gerstäcker, 1883) as being present in the collection of Environment Abu Dhabi, but without further indications. The identification of this species known only from Turkey is highly improbable. In the present paper three species are recorded and diagnoses and illustrations of them are given. The genus *Brevistoma* Mukhina, 1981, is recorded from the UAE for the first time.

MATERIALS AND METHODS

All examined specimens were collected in the UAE, and unless otherwise stated, by Antonius van Harten. The nemopterids were caught mainly with light traps which were operated at four localities of the country. The examined material is divided between UAE Invertebrate Collection and the collection of the Hungarian Natural History Museum.

Abbreviations used in the text: AL = at light; AvH = Antonius van Harten; KS = K. Szpila; LT = light trap; TP = T. Pape.

SYSTEMATIC ACCOUNT

Subfamily **Nemopterinae** Burmeister, 1839
(Hind wing narrow band like, with distal dilatation.)

Brevistoma gallagheri Hölzel, 1999

Figures 1-2

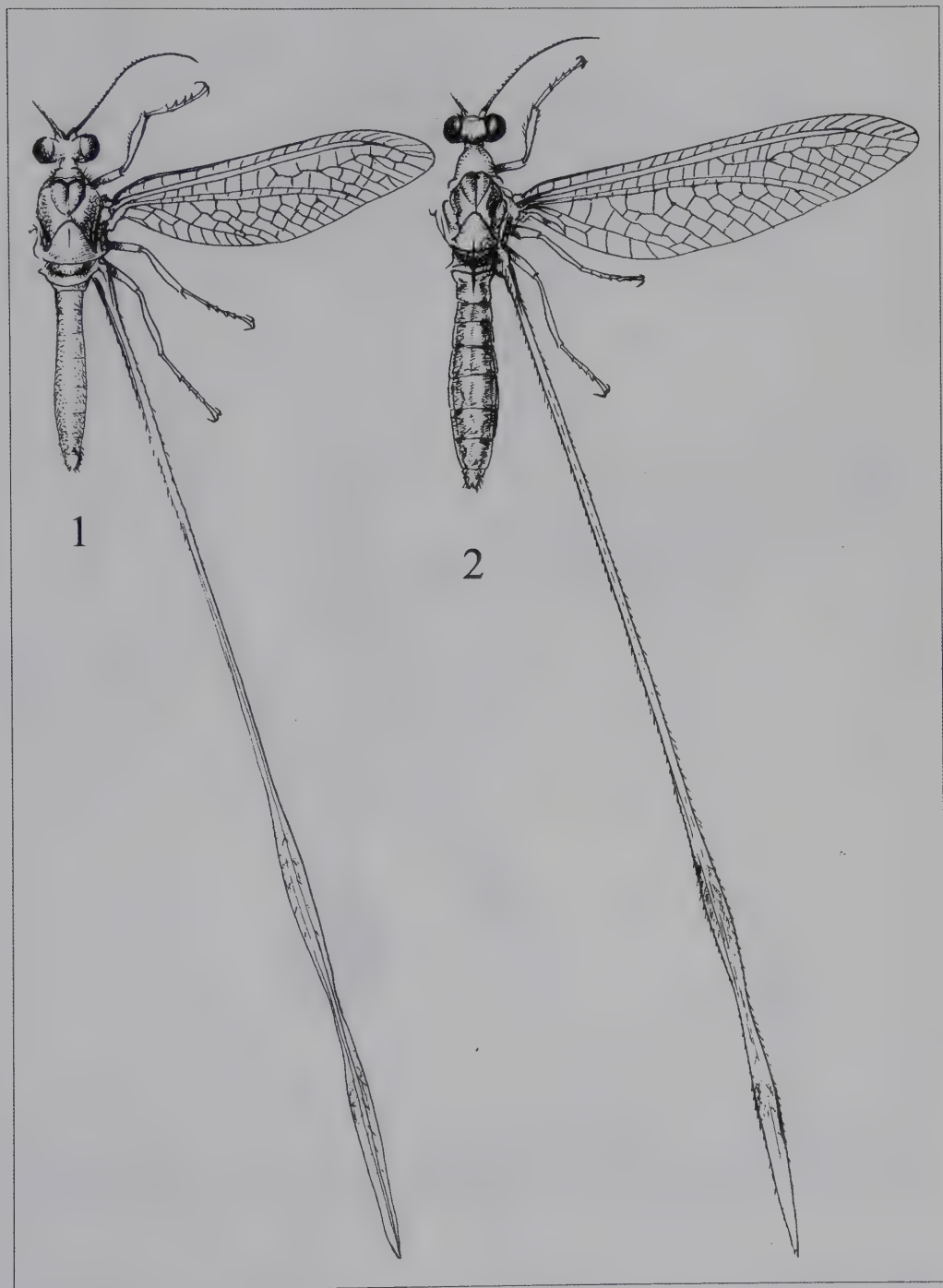
Specimens examined: Near Mahafiz, 2♀, 24–30.vi.2006, LT. Sharjah Desert Park, 1♀, 7–15.v.2005, LT; 1♂, 30.iv–31.v.2005, LT.

Diagnosis: Length of fore wing 14–20 mm, of hind wing 26–42 mm. Antennae 5–7 mm; shorter than half the fore wing. Distal dilatation moderate in both genders, with two brown strips.

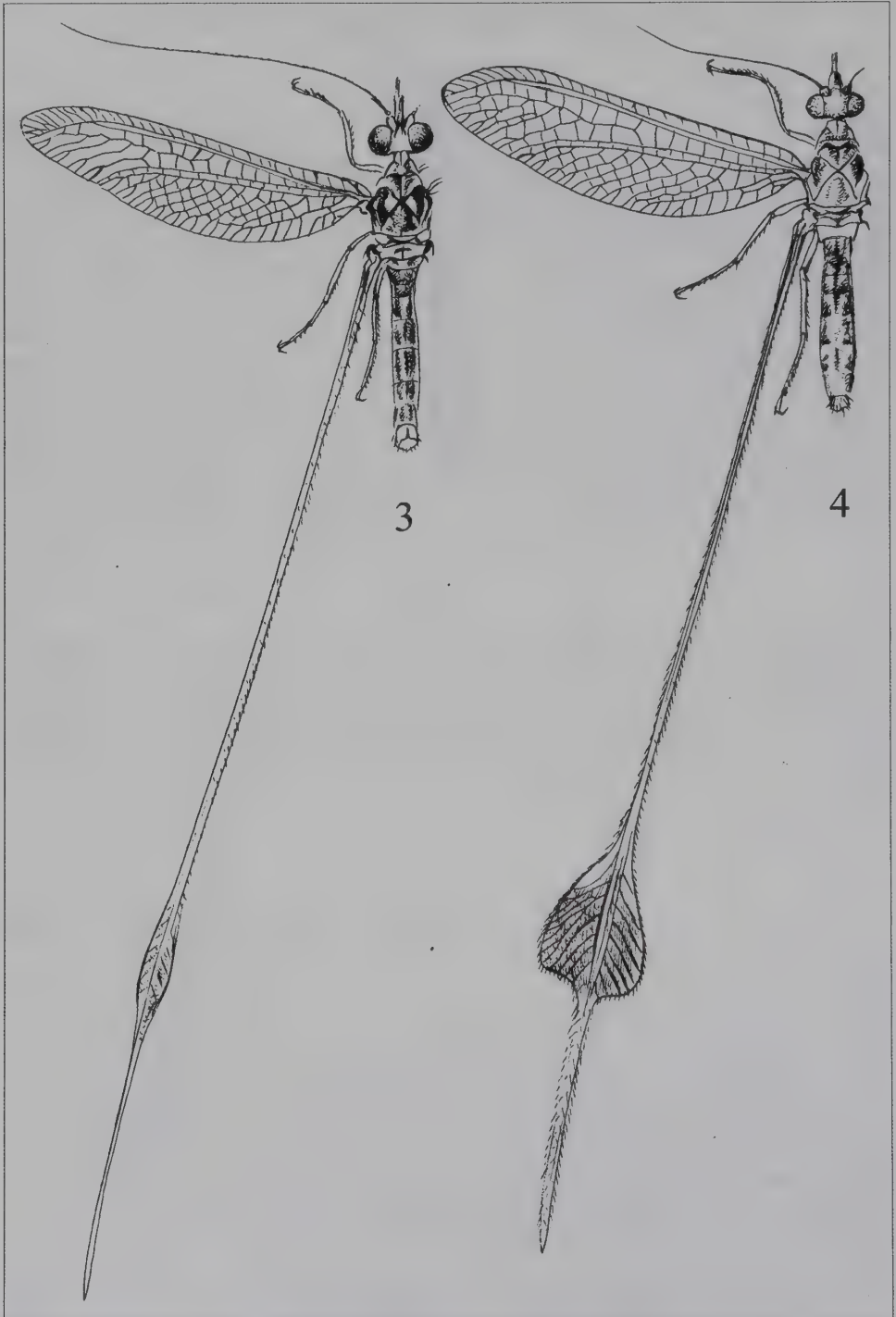
Description of female: Length of the body 13 mm, of fore wing 19–20 mm, of hind wing 42 mm, of antennae 5–5.5 mm. Rostrum 0.8 mm. Large part of antennae medium or dark brown, basal part light brown. Head capsule, thorax and legs light brown. Claws and ventral spines of tarsi black. Abdomen pale ochreous, with a thin median and two lateral bands. Wing membrane – apart from the dark brown strips on distal part of hind wing – hyaline; veins yellowish brown.

Remark: Hitherto only the male holotype of this species was known.

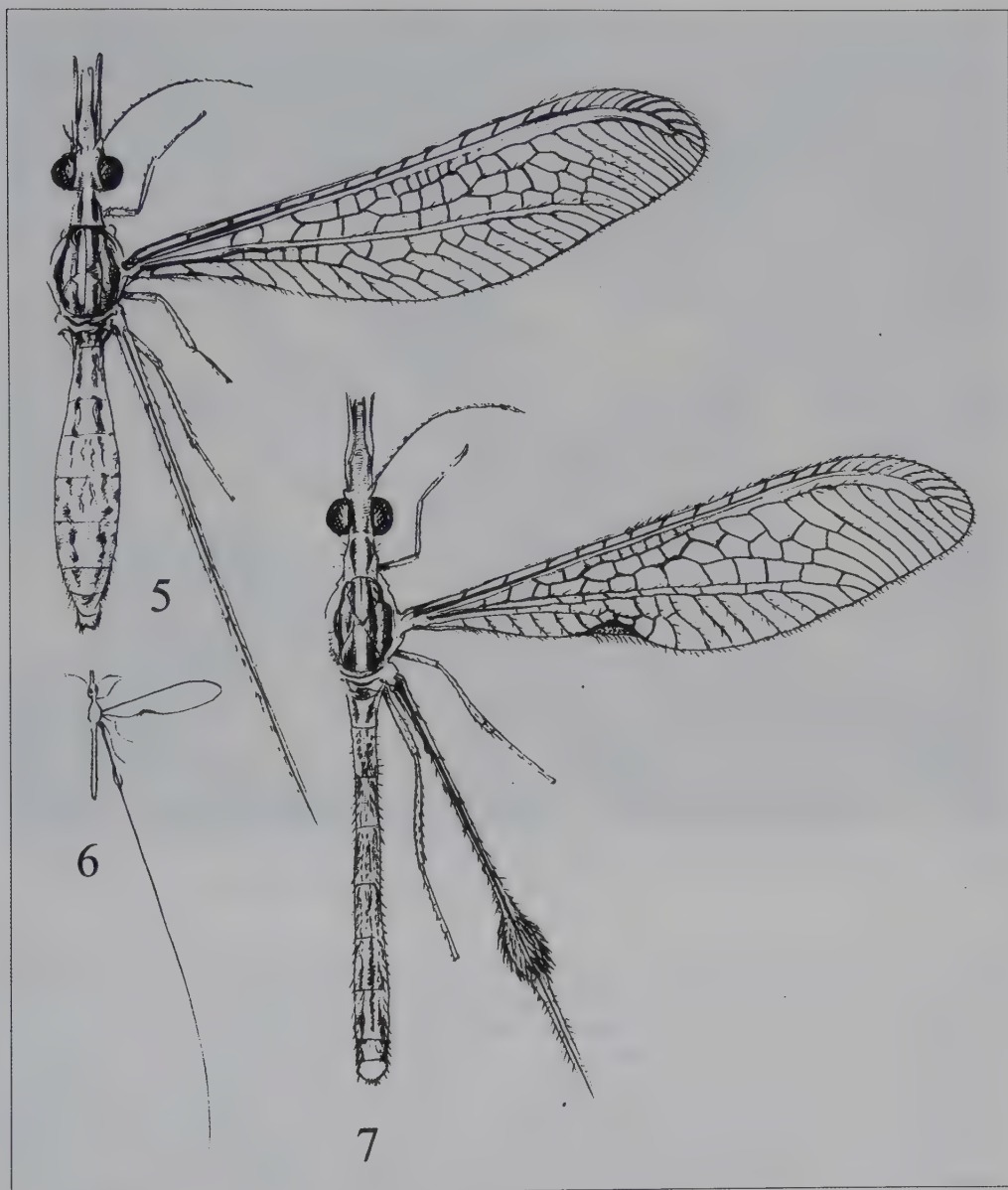
Distribution: Oman. New to the fauna of UAE.



Figures 1–2: *Brevistoma gallagheri* Hölzel. 1: Male, without left wings, legs and antenna. 2: Female without left wings, legs and antenna. (Drawings by János Pál)



Figures 3–4: *Halter nutans* Navás. 3: Male, without right wings, legs and antenna; 4: Female, without right wings, legs and antenna. (Drawings by János Pál)



Figures 5–7: *Dielocroce elegans* Alexandrov-Martynov. 5: Female, without left wings, legs, antenna, and distal part of right hind wing; 6: Male in outline, without left wings and legs; 7: Male, without left wings, legs, antenna, and distal part of right hind wing. (Drawings by János Pál)

***Halter nutans* Navás, 1910**

Specimens examined: Near Mahafiz, 1♂, 23.iv.2005, AL & LT, leg. AvH & KS. Sharjah Desert Park, 1♂, 21–29.iii.2005, LT; 13♂, 5♀, 29.iii–6.iv.2005, LT; 11♂, 32♀, 6–30.iv.2005, LT; 2♂, 2♀, 7–16.v.2005, LT.

Plate 1, Figures 3–4



Plate 1. *Halter nutans* Navás, female, in al-Ain. (Photograph by V. Korshunov)

Diagnosis: Length of fore wing 16–26 mm, of hind wing 34–62 mm. Antennae of male about as long as fore wing; always reach beyond the pterostigma. In females the height of the eyes equal to the width of frons. Distal dilatation of female hindwing lobe-like.

Remarks: M. Gillet & C. Gillet (2005) mention another *Halter* species, namely *H. halteratus* as a common nemopterid in al-Ain and Dubai. However, only specimens of *H. nutans* have been found in the rather large examined material. Moreover, according to Hölzel (1999), *H. halteratus* is not known neither from the UAE nor from Oman. Therefore, the nemopterid species mentioned by M. Gillett & C. Gillett with high probability refers to *H. nutans*. For the same reason, it should be checked whether the *Halter* specimen(s) of the National Museums of Scotland (Whittington, 2002) represent(s) really *H. halteratus*, or rather *H. nutans*.

Distribution: Afghanistan, Pakistan, Iran, Iraq, Oman. New to the fauna of UAE.

Subfamily Crocinae Navás, 1910

(Hind wing filiform, without distal dilatation.)

Dielocroce elegans Alexandrov-Martynov, 1930

Specimens examined: Wadi Madaq, 13♂, 15♀, 18.iv.2005, AL & KS; 1♀, 27.iv–4.v.2006, LT; 39♂, 41♀, 27.iv–5.v.2006, LT. Wadi Safad, 5♂, 4♀, 15–22.iv.2006, LT.

Figures 5-7

Diagnosis: Length of fore wing 11–14 mm, of hind wing 30–40 mm. Thorax with dark brown strips. Longitudinal vein Sc entirely dark brown.

Remarks: Gillett & Howarth (2004) listed this species as occurring on Jebel Hafit and neighbouring areas. M. Gillett & C. Gillet (2005) mentioned, that W. Thesiger collected this species in the al-Ain region, but the exact locality of this collecting was in the Omani part of this region, in Buraimi (Meinander, 1980).

Distribution: Afghanistan, Pakistan, Iran, most of the countries of Arabian Peninsula, Israel, Syria.

ACKNOWLEDGEMENTS

I am indebted to Antonius van Harten for sending the investigated material and to János Pál for making the drawings. Vladimir Korshunov, Management of Nature Conservation, al-Ain, provided the photograph.

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Author's address:

Dr. Gy. Sziráki, Hungarian Natural History Museum, Department of Zoology, Baross utca 13, 1088 Budapest, Hungary; e-mail: sziraki@zoo.zoo.nhmus.hu

Order Hemiptera, suborder Heteroptera

Infraorders Nepomorpha, Gerromorpha, and Leptopodomorpha

Rauno E. Linnavuori, Petr Kment and Attilio Carapezza

INTRODUCTION

Heteroptera, or the true bugs, represent the most diverse group of Hemiptera with more than 40,000 described species classified in ca. 89 recent families and 7 infraorders. Unlike the phytophagous and terrestrial Sternorrhyncha, Fulgoromorpha, Cicadomorpha, and Coleorrhyncha, true bugs developed more diverse ways of life, including also aquatic and semiaquatic groups, ocean and intertidal species, predators and blood-sucking ectoparasites (Schuh & Slater, 1995; Forero, 2008; Weirauch & Schuh, 2011). Some of the heteropteran species are of economic importance, being agricultural pests, plant disease vectors or predators used for biocontrol (Schaefer & Panizzi, 2000) or more rarely acting as nuisance and blood-sucking parasites of humans and livestock (e.g. Al-Houty, 1990; Selim et al., 1990).

Our knowledge of Heteroptera living in the Arabian Peninsula is still insufficient and unbalanced. Relatively well studied are faunas of Saudi Arabia (Linnavuori, 1986) and Yemen (Linnavuori 1989; Linnavuori & van Harten, 1997, 2000, 2002, 2005, 2006a), for which comprehensive species lists were prepared rather recently, including references to earlier papers. Additional records from these two countries could be found also in several dozens of recent taxonomic revisions. On the other hand, the remaining countries are still rather untouched and knowledge of their fauna is limited to few scattered records only, e.g. from Kuwait (Al-Houty, 1989, 1990; Al-Houty & Dolling, 1999; Ghauri, 1985; Jaczewski, 1927; Linnavuori, 1992, 1993a,b; Menke, 1963; Selim et al., 1990) and Oman (e.g. Horváth, 1915; Hungerford & Evans, 1934; Lansbury, 1968; Odhiambo, 1968; Linnavuori, 1993a; Gorczyca, 2000; Linnavuori & Gorczyca, 2002; Burt, 2003; Lis, 2003). Some records could be found also in the field guide by Walker & Pittaway (1987). Most of the Heteroptera records published from the United Arab Emirates were summarized by van Harten (2005), however, the list is short at only 14 species. Some additional records from UAE were neglected (Brown, 1950; Lansbury, 1968; both misinterpreted as referring to Oman) or published recently (Stutt & Silva-Jothy, 2001; Moulet, 2006; Perez Goodwyn, 2006; Hradil et al., 2007), including description of one new species by Linnavuori & van Harten (2006b). Most of the reliable records from particular countries were excerpted in the five volumes of the 'Catalogue of the Heteroptera of the Palaearctic Region' by Aukema & Rieger (1995, 1996, 1999, 2001, 2006).

From adjacent regions to the Arabian Peninsula, we have comprehensive lists for faunas of Jordan (Katbeh et al., 2000; Carapezza, 2002) and Iraq (Linnavuori, 1984, 1992, 1993a,b, 1994a, 1995). Better known is the very diverse fauna of Iran, for which exist special papers either devoted to particular families (e.g. Hoberlandt, 1983) or regions, including the southern provinces of Khuzestan, Bushehr, and Hormozgan (Linnavuori, 2004a,b,c, 2009, 2010).

This contribution is the first part of a series dealing with the Heteroptera fauna of the United Arab Emirates, namely the infraorders Nepomorpha, Gerromorpha and Leptopodomorpha. The Palaearctic Catalogue by Aukema & Rieger (1995) included no record of these bugs from UAE. Brown (1950) recorded five species of aquatic and semiaquatic bugs from Ra's al-Khaimah including one new species, however, he referred to this territory as Oman: *Laccotrephes fabricii* Stål, 1868, *Anisops debilis* Gerstaecker, 1873, *Enithares lineatipes*

Horváth, 1889 (Notonectidae), *Neogerris parvulus* (Stål, 1860), and *Metrocoris omanensis* Brown, 1950 (= *M. communis* (Distant, 1910)). Brown's (1950) specimens were later re-examined by other specialists, though all of them continued to refer to Ra's al-Khaimah as Oman (Lansbury, 1968; Andersen, 1975; Chen & Nieser, 1993). Gillett & Howarth (2004) recorded three species from Jebel Hafit – *Heleocoris minusculus* (Walker, 1870) (Naucoridae), *Anisops debilis perplexus* Poisson, 1929 (Notonectidae), and *Neogerris parvulus* (Gerridae) (cf. van Harten, 2005). Finally, Perez Goodwyn (2006) provided a record of *Lethocerus patruelis* (Stål, 1854) (Belostomatidae). Here we review all the available material of aquatic and semiaquatic bugs, recording 14 families and 22 species, 15 of them being new records for the United Arab Emirates. We provide short diagnosis for each infraorder, family and species, as well as short account of biology and distribution of each species. We provide habitus photograph of each species as well as photographs of selected habitats of aquatic and semiaquatic bugs in the United Arab Emirates.

MATERIALS AND METHODS

The material presented within this study was collected by Antonius van Harten (if not indicated otherwise), in lesser extent by J. Batelka (JB), F.M. Buzzetti (FB), A. Carapezza (AC), M. Fibiger (MF), J.-L. Gattolliat (JG), K. Mahmood (KM), and H. Pinda (HP). It was identified by all three authors of the study as it is indicated below (AC = Attilio Carapezza, PK = Petr Kment, RL = Rauno Linnavuori). Examined specimens are deposited in the following collections: Attilio Carapezza collection, Palermo, Italy; Jan Batelka collection, Praha, Czech Republic; National Museum, Praha, Czech Republic (NMPC); Rauno Linnavuori collection, Finland, and the UAE Invertebrate Collection. For more details on collecting methods and sampled habitats see van Harten (2008).

The nomenclature used follow Aukema & Rieger (1995) and Fent et al. (2011).

Abbreviations used: NARC = National Avian Research Centre; HC = hand collected; LT = light trap; MT = Malaise trap; WT = water (= pan) traps; ap = apterous; ma = macropterous; mi = micropterous; L = larva(e).

SYSTEMATIC ACCOUNT

Infraorder **Nepomorpha** Popov, 1968 (Aquatic Bugs)

Small, medium-sized to large or very large true bugs. Antennae very short, shorter than head, usually concealed in grooves below the eyes and not visible from above. Rostrum usually stout, often apparently 3-segmented (except in Corixoidea). Head without trichobothria (i.e. long slender setae inserted in deep pits) near the inner margin of compound eyes. Fore legs often modified (raptorial or otherwise). Hind legs often flattened and fringed with swimming hairs. Fore wings modified as hemelytra, with a coriaceous basal part and membranous distal part, with well developed wing-to-body coupling mechanism. Most aquatic bugs are predators, only some Corixoidea may be polyphagous. They inhabit various types of freshwater habitats, rarely saline waters, and few species are secondarily non-aquatic, living mostly in littoral habitats (Gelastocoridae, Ochteridae) (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Superfamily **Nepoidea** Latreille, 1802

Family **Nepidae** Latreille, 1802 (Water Scorpions)

Brownish, either dorso-ventrally flattened, suboval or subcylindrical water bugs which are medium-sized to very large (body length 12–60 mm excluding respiratory siphon). Ocelli absent. Antenna shorter than head, hidden in groove beneath eyes, usually 3-segmented with segments 2 and 3 often with finger-like projection. Rostrum 4-segmented, short. Fore legs raptorial, femur widened and with a ventral groove to receive tibia and tarsus. Mid and hind legs slender and unmodified. All tarsi 1-segmented. Membrane of hemelytra well developed with reticulate venation. Slender, non-retractable respiratory siphon arising from the end of abdomen, rather short to very long (even longer than the body), composed of two halves which are not entirely fused and may split in dry specimens. Metathoracic scent glands absent. Ambush predators with poor swimming abilities. Most water scorpions prefer stagnant or slowly moving water (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Nepinae** Latreille, 1802

Tribe **Nepini** Latreille, 1802

Genus **Laccotrephes** Stål, 1866

Laccotrephes (Laccotrephes) fabricii fabricii Stål, 1868

Plate 1

Specimens examined: Wadi Maidaq, 1♂, 8.ii.2010, in water stream, KM lgt., PK det. Wadi Shawqah, 2L, 22.ii.2010, in water stream, KM lgt., PK det. Wadi Wurayah, 1L, 1.ii.2010, in water stream, KM lgt., PK det.

Published record: 'Arabia: Oman, Ras-al-Khaimah, 16.v.1949, 1♂' (Brown, 1950).

Diagnosis: Very large insect with body length 38–45 mm without the siphon, the siphon longer than body (50–85 mm). Body mostly dark brown, thorax ventrally and abdomen both ventrally and dorsally brown orange, fore femur often annulated with darker brown. It is the only nepine species recorded from the Arabian Peninsula. For more details and illustrations see Poisson (1965, genitalia) and Gadalla et al. (2001).

Biology: Inhabiting shallow pools with muddy or sandy bottom, permanent springs as well as slowly moving streams with little vegetation (Brown, 1951; Linnavuori, 1986; Gadalla et al., 2001). In the UAE collected in water streams (this paper).

Distribution: Known from tropical and North Africa, Sinai, Israel, Jordan, Saudi Arabia, Yemen, and Iran (Polhemus, 1995a; Katbeh et al., 2000; Gadalla et al., 2001). The record from Oman (Polhemus, 1995e) seems to refer to the United Arab Emirates (cf. Brown, 1950).

Family **Belostomatidae** Leach, 1815 (Giant Water Bugs)

Large to very large aquatic bugs, body length 9–120 mm; representatives of the genus *Lethocerus* Mayr, 1853, being the largest true bugs in the world. Body oval to elongate oval, dorso-ventrally flattened. More or less uniformly medium brown; legs yellowish to light brown, often annulated with darker brown. Ocelli absent. Antenna usually 4-segmented, shorter than head and lying in groove beneath eyes; at least segments 2 and 3 with dorsal projections. Rostrum 3-segmented, short to moderate in length. Fore legs raptorial (except of Afrotropical malacophagous *Limnogeton* Mayr, 1853), fore femora enlarged with tibia apposed. Middle and hind legs usually flattened and fringed with swimming hairs. Membrane

of hemelytra usually well developed with numerous veins. Abdominal tergum 8 is modified into a pair of retractable respiratory air-straps. Belostomatids have a unique reproduction biology with the male caring for the eggs; sometimes the female lays its eggs on the back of the male which 'broods' the eggs until they hatch (Belostomatinae). They prefer stagnant water or sluggish parts of streams and prey on various animals they can subdue (including small vertebrates) (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005; Perez Goodwyn, 2006).

Subfamily **Lethocerinae** Lauck & Menke, 1961

Genus **Lethocerus** Mayr, 1853

Lethocerus patruelis (Stål, 1854)

Plate 2

Specimens examined: Khor Kalba (tunnel), 2 ex., 24.iii.2010, FB observed.

Published record: '1♂, United Arab Emirates "Wasserfalltal bei Kordofkhan" [= waterfall valley at Kordofkhan]' (Perez Goodwyn, 2006). Most probably the locality is the only waterfall in the UAE at Wadi Wurayah, which is not very far from a locality called Khor Fakkan.

Diagnosis: Very large insect (body length 58.5–80.0 mm), brown, of characteristic appearance, the only species of the genus occurring in the Near East. For precise identification see Kanyukova & Kerzhner (1980) and Perez Goodwyn (2006).

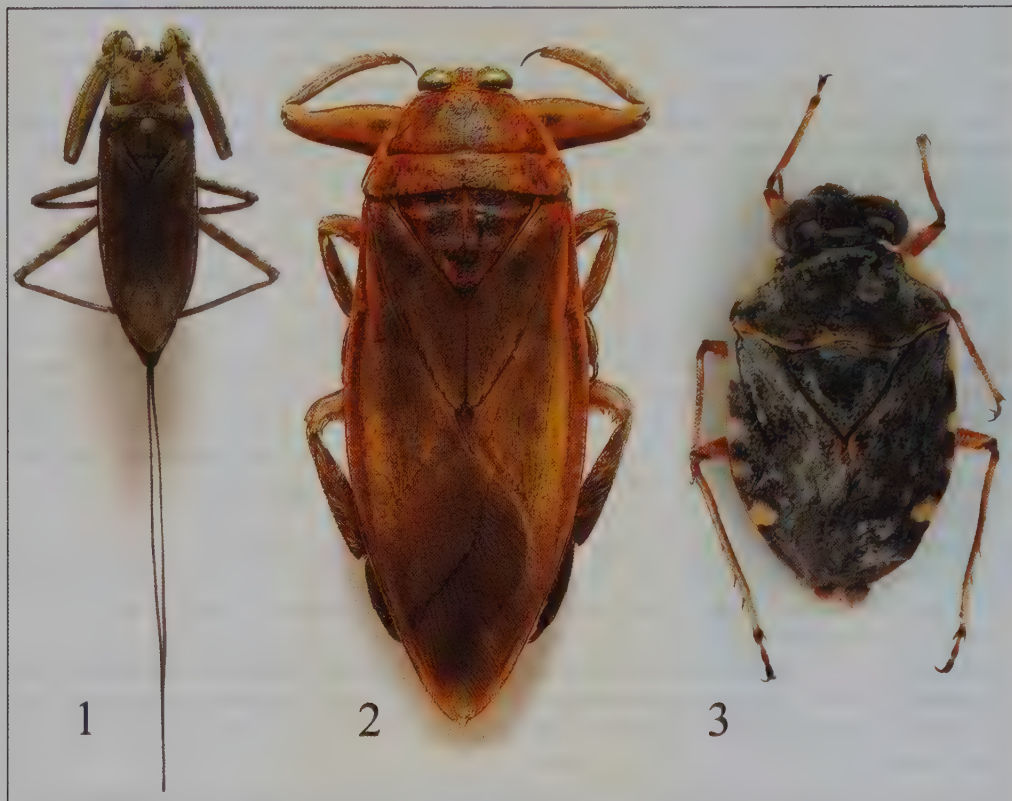
Biology: In rivers, marshes, and pools with sparse to dense vegetation (Schumacher, 1917; Jaczewski, 1936). Also caught at sea in ports (Schumacher, 1917). Often collected at light (Linnavuori, 1994a; Linnavuori & Hosseini, 2000). In the UAE, two specimens of this species were observed in a large pool near the farm close to the tunnel alongside the Sharjah–Khor Kalba road (F.M. Buzzetti, pers. comm.).

Distribution: Known from Balkan Peninsula, Turkey, Israel, Syria, Iraq, Kuwait, Saudi Arabia, Yemen, Iran, Afghanistan, Pakistan, India, Nepal, and Burma (Polhemus, 1995b; Perez Goodwyn, 2006). Recently collected in Italy (Bacchi & Rizzotti Vlach, 2006; Olivieri, 2009).

Superfamily **Ochteroidea** Kirkaldy, 1906

Family **Ochteridae** Kirkaldy, 1906 (Velvety Shore Bugs)

Small or medium-sized bugs (3.4–9.8 mm), broadly oval, moderately dorso-ventrally flattened with a velvety hair-pile on dorsum. Predominantly blackish with yellowish to light brown markings. Antennae 4-segmented, shorter than head but in dorsal view often not fully concealed beneath it. Compound eyes large, with inner margins emarginated. Ocelli present. Rostrum 4-segmented, very long and slender, reaching the hind coxae. All legs slender and adapted for walking (cursorial), without swimming hairs; fore legs not raptorial. Membrane of hemelytra well developed with 7 cells in *Ochterus* Latreille, 1807. Male genitalia asymmetrical. Ochteridae are notable for their similarity to the Saldidae (Leptopodomorpha) but differ by possessing all essential nepomorphan characters, especially the very short antennae. Ochteridae are shore dwellers, not true aquatic bugs. They usually live at the margin of running freshwater and are mostly found at sandy or stony places with little vegetation. They can run rapidly or jump when disturbed (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).



Plates 1–3. 1: *Laccotrephes (Laccotrephes) fabricii fabricii* Stål, male, Wadi Madaq; 2: *Lethocerus patruelis* (Stål), male, Greece: Thessaloniki, 1968, A. Novák lgt., NMPC; 3: *Ochterus (Ochterus) marginatus marginatus* (Latreille), female, Wadi Wurayah. (Photographs by P. Kment)

Genus *Ochterus* Latreille, 1807

Ochterus (Ochterus) marginatus marginatus (Latreille, 1804)

Plate 3

Specimen examined: Wadi Wurayah, 1♀, 14.xi–4.xii.2006, MT, RL det.

Diagnosis: Body length 4.0–5.0 mm. Opaque, black, eyes greyish brown; lamellate lateral margins and basal margin of pronotum yellow; costal margins of hemelytra with yellow spots; legs yellowish. It differs from all other aquatic bugs by its terrestrial habits, from all terrestrial bugs by the short antenna invisible from above. For exact identification and illustrations of characters see e.g. Kormilev (1971).

Biology: Living at the edge of running water, mostly at sandy or stony places with little vegetation (Brown, 1951; Boulard & Coffin, 1991; Chen et al., 2005; Kanyukova, 2006). Larvae are nearly always covered with sand and loam (Boulard & Coffin, 1991). Our specimen from the UAE was collected in a Malaise trap (this paper).

Distribution: Widely distributed in tropical and North Africa, southern Europe, Near East, Saudi Arabia, Iran, Afghanistan, Turkmenistan, China, Taiwan, Korea, Japan, and tropical

Africa and Asia (Polhemus, 1995c; Katbeh et al., 2000; Fent et al., 2011). New to the United Arab Emirates.

Superfamily **Corixoidea** Leach, 1815

Family **Micronectidae** Latreille, 1802 (Pygmy Water Boatmen)

Small water bugs, dorsoventrally flattened. Similar to Corixidae in the following characters: Head broad, strongly deflected (hypognathous), its posterior margin covering anterior margin of pronotum. Eyes large, kidney shaped. Ocelli absent. Rostrum broadly triangular, immovably fused to head, not segmented but usually with transverse grooves. Fore tarsus 1-segmented (pala) and fringed with long hairs. Middle legs very long and slender with very long paired claws. Hind legs flattened, oar-like, fringed with hairs, tarsi 2-segmented. Membrane without veins. Distal segments of male abdomen and male genitalia strongly asymmetrical, abdominal dorsum usually bearing strigil. Micronectidae differ from Corixidae as follows: Usually smaller size (0.8–5.0 mm). Dorsal colouration brownish, usually with darker longitudinal stripes. Antennae 3-segmented. Mesoscutellum exposed behind pronotum. Fore tarsus (pala) of male spoon-shaped, in females fore tarsus and tibia fused. Claw of hind tarsus inserted apically. Males stridulate by rotation of genital capsule. The food of Micronectinae is unknown. Typically they are inhabitants of stagnant water, less often in running water; most prefer scarcely vegetated places (Jansson, 1986; Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Micronectinae** Latreille, 1802

Genus **Micronecta** Kirkaldy, 1897

Micronecta (Dichatonecta) desertana desertana Distant, 1920

Plate 4

Specimens examined: Bithnah, 1 ex., 31.xii.2005–2.ii.2006, LT, RL det. Wadi Maidaq, 1♂, 1♀ (ma), 27.iv–12.vi.2006, LT, PK det. Wadi Shawkah, 4 spec., 4.ii.2010, in water stream, KM lgt., RL det.; 1♀, 30.iii.2010, FB lgt., AC det. Wadi Wurayah, many ex., 26.xi.2006, in water, JG lgt., RL det.

Diagnosis: Body length 2.31–2.64 mm, body stout, 2.07–2.16 times longer than wide. Macropterous. Pronotum and elytra pale greyish brown, lateral margins of the latter yellowish, clavus in some specimens with an obscure basal, apical and elongate external brown spots, corium with traces of dark longitudinal markings. The major diagnostic characters are structure of male genitalia and abdomen (e.g. Hutchinson, 1940; Wróblewski, 1972).

Biology: Collected in desert conditions in Iran (Hutchinson, 1940). In the UAE collected in water stream as well as by light traps (this paper).

Distribution: Known from Iran and Oriental Region (Jansson, 1995). New to the United Arab Emirates.

Micronecta (Sigmonecta) quadristrigata Breddin, 1905

Plate 5

Specimens examined: Many specimens from the following localities: Al-Ajban, 6–22.v.2006, LT, RL det.; 7–27.xii.2006, LT, PK det. SSW of ad-Dhaid, 23.iv.2005, LT; 10–29.xii.2005, LT, RL det. Fujairah, 6.iv–2.vii.2005, LT, RL det. 7–10 km S of al-Jazirat al-Hamra, 27.ii.2006, HC, RL det. Mahafiz, 29.xii.2005–7.i.2006, LT, RL det. Sharjah Desert Park, 14.x–8.xii.2004, LT; 20.i.–6.iv.2005, LT; 30.iv.–5.viii.2005, LT; 1–25.ii.2006, LT, RL det. NARC, near Sweihan, 16.xi–21.xii.2005, LT, RL det. Wadi Safad, 31.i–21.ii.2006, LT, RL det. Wadi Shawkah, 27–28.xi.2006, LT, JG lgt., RL det. Wadi Wurayah, 26.xi.2006, in water, JG lgt., RL det.



Plates 4–5. 4: *Micronecta (Dichatonecta) desertana desertana* Distant, macropterous femal, Wadi Wurayah; 5: *Micronecta (Sigmonecta) quadristrigata* Breddin, macropterous female, Sharjah Desert Park. (Photographs by P. Kment)

Diagnosis: Body length 2.2–3.28 mm, body slender, 2.1–2.35 times longer than wide. Macropterous. Hemelytra greyish brown, clavus with distinct pale basal spot and one brown longitudinal line, corium with 4 brown longitudinal stripes, however, the dark lineation on hemelytra is very variable and may be obsolescent. The major diagnostic characters are structure of male genitalia and abdomen (e.g. Lundblad, 1934; Hutchinson, 1940; Wróblewski, 1972).

Biology: In Oriental Region collected in lakes, ponds, various pools (including brackish ones), springs, hot springs, brooks, flooded paddy-fields as well as in city fountain in Calcutta and other temporary habitats. Often collected at light (Lundblad, 1933; Hutchinson, 1940; Fernando, 1959, 1961, 1964; this paper).

Distribution: Known from Iran, south-east China, Taiwan, and Oriental Region (Jansson, 1995). New to the United Arab Emirates.

Family **Corixidae** Leach, 1815 (Water Boatmen)

Small to medium-sized water bugs, usually elongate and parallel-sided, dorsum flattened. Similar to Micronectidae in general structure of the body (see above). However, Corixidae differ from Micronectidae in the following characters: Larger size (3.0–16.0 mm). Dorsal colouration medium brown with yellowish markings. Antennae 4-segmented. Mesoscutellum completely covered by pronotum. Female pala not fused with tibia, spoon-shaped; male pala spoon-shaped or of a different form; pala with a palm-like concavity in both sexes. Hind

tarsal claw included subapically. Both males and females of several species stridulate, usually by rubbing the fore femoral peg fields over the edges of maxillary plates of head. Corixidae may be polyphagous, but most species prefer animal food. They usually live in stagnant waters (Jansson, 1986; Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Corixinae** Leach, 1815

Tribe **Corixini** Leach, 1815

Genus ***Heliocoris*** Lundblad, 1928

Heliocoris vermiculata (Puton, 1874)

Plate 8

Specimens examined: Many specimens from the following localities: Al-Ajban, 9.xi–7.xii.2005, LT+MT; 28.xii.2005–28.ii.2006, MT; 27.v–26.vi.2006, LT, RL det.; 7–27.xii.2006, LT, PK det. SSW of ad-Dhaid, 10–29.xii.2005, LT, RL det. Fujairah, 18–19.iv.2006, LT, MF lgt., RL det. 7–10 km S of al-Jazirat al-Hamra, 27.ii.2006, HC, RL det. Mahafiz, 29.xii.2005–7.i.2006, LT, RL det. Margham, 163 m a.s.l., 19.xi.2006, LT, JB & HP lgt., PK det. Wadi Bih dam, 25.iii.2010, HC, FB lgt., AC det. Wadi Wurayah farm, 1–8.iv.2009, LT+MT, RL det.

Diagnosis: Body length 5.0–6.0 mm; upper surface shiny, pronotum crossed by 9–10 yellow lines, pale lines on clavus mostly unbroken, corial pattern vermiculate; claval suture concave and lateral edge of clavus extending basally somewhat over the sutural pruinose area; male pala with single row of pegs limited to the basal half; male asymmetry sinistral, strigil relatively small. Distinguishing characters are illustrated by Jansson (1986), Linnavuori & Hosseini (2000) and Kanyukova (2006).

Biology: Common in pools, lakes, evaporation lakes, irrigation canals as well as brooks and rivers with *Phragmites* and other vegetation. Also in brackish water. Often collected at lamps (Linnavuori, 1986, 1994a, 2009; Kanyukova, 2006; this paper), in the UAE also found in a Malaise trap (this paper).

Distribution: Known from Iberian Peninsula, France, Sicily, North Africa, South of European Russia (Daghestan), Armenia, Azerbaijan, Iraq, Saudi Arabia, Iran, Central Asia, and Oriental Region (Jansson, 1995; Fent et al., 2011). New to the United Arab Emirates.

Genus ***Sigara*** Fabricius, 1775

Sigara (Sigara) assimilis (Fieber, 1848)

Plate 9

Specimens examined: Al-Ajban, 1 ex., 28.xii.2005–28.ii.2006, MT, RL det. Sharjah Desert Park, 6 ex., 20.i–6.iv.2005, LT, 30.iv.–5.viii.2005, LT, RL det. NARC, near Sweihan, 1 ex., 14.iii–2.iv.2005, LT, RL det. Wadi Madaq, 1♂, 25.iii.2010, HC, FB lgt., AC det.

Diagnosis: Body length ca. 7 mm; pronotum with 8–10 transverse pale bands; transverse yellow lines of clavus usually regular and the most anterior ones widened, corial pattern with fragmented transversal pale lines; male pala with two palar peg rows, distal end of proximal peg row of pala reaching beyond proximal end of distal peg row; male asymmetry dextral; strigil large. Distinguishing characters are illustrated by Jansson (1986), Linnavuori & Hosseini (2000) and Kanyukova (2006).

Biology: Salt lakes and marshes, also in rivers, or an oligotrophic pool with sandy bottom. Several times collected at lamps (Linnavuori, 1986, 1994, 2009; Kanyukova, 2006; this paper) in the UAE; also in a Malaise trap (this paper).

Distribution: Known from Hungary, Balkan Peninsula, Ukraine, South of European Russia, Transcaucasia, Turkey, Iraq, Saudi Arabia, Iran, Afghanistan, Central Asia, Western Siberia,

Mongolia, northern China, and Japan (Jansson, 1995; Fent et al., 2011). New to the United Arab Emirates.

***Sigara (Tropicorixa) hoggarica* Poisson, 1929**

Plate 10

Specimens examined: Sharjah Desert Park, 1♀, 1 ex., 30.iv–21.v.2007, LT, PK & RL det. Wadi Madaq, 1 ex., 29.xi–22.xii.2005, LT; 1♀, 28.xi.2006, in pool, JG lgt., RL det.; 1♂, 23.iii.2010, FB lgt., AC det.; 380 m a.s.l., 39♂, 13♀, 7.iii.2007, in irrigation canal, HC, AC lgt. & det. Wadi Safad, 1 ex., 14–21.v.2006, LT, RL det. Wadi Shawkah, 1♂, 2♀, 30.iii.2010, HC, FB lgt., AC det.

Diagnosis: Body length 5.6–6.8 mm; pronotum black with 7–9 transverse yellow lines; both clavus and corium with greatly fragmented vermiculate pattern; pronotum densely rastrate, clavus nearly smooth; male pala with single row of paler pegs; male asymmetry dextral, apex of right paramere T-shaped; strigil rather large. Distinguishing characters are illustrated by Poisson (1929) and Linnavuori & Hosseini (2000).

Biology: Collected in ponds, shallow pools, rivers, brook with gravelly bottom, irrigation dikes as well as in rice-field (Brown, 1951; Linnavuori, 1964, 1971, 1986, 1994a, 2009; Linnavuori & van Harten, 1997; Alahmed et al., 2009). In the UAE collected in an irrigation canal (Plate 6) or rocky pools in a dried-out wadi (Plate 7). Also collected at light (Linnavuori, 2009; this paper). Alahmed et al. (2009) reported *S. hoggarica* as an efficient predator of mosquito larvae.

Distribution: Known from Ethiopia, North Africa, Israel, Saudi Arabia, Yemen, Oman, Iraq, Iran, and India (Jansson, 1995; Fent et al., 2011; B. Aukema, pers. comm.). New to the United Arab Emirates.

***Sigara (Vermicorixa) lateralis* (Leach, 1817)**

Plate 11

Specimens examined: Numerous specimens collected from the following localities: Al-Ajban, 9.xi–7.xii.2005, LT+MT, RL det. Bithnah, 31.xii.2005–2.ii.2006, LT, RL det. SSW of ad-Dhaid, 23.iv.2005, LT; 10–29.xii.2005, LT; RL det. Fujairah, 24.ii–24.iii.2005, LT, 28.ii–1.iv.2006, LT, 15–22.iv.2006, LT, RL det.; 8.iv–3.vi.2006, LT, PK det. Hatta, 8–26.iv.2006, LT; 21–28.viii.2006, LT, RL det. Mahafiz, 29.xii.2005–7.i.2006, LT, RL det. Sharjah Desert Park, 30.iv–5.viii.2005, LT; 20.x–8.xi.2005, LT; 25.ii–25.iii.2006, LT; 2.iii–1.iv.2007, LT; 2.iii–1.iv.2009, LT, RL & PK det. Sharjah-Khor Kalba (near tunnel), 16–31.i.2006, LT, RL det. NARC, near Sweihan, 14.iii–2.iv.2005, LT; 28.xii.2005–22.i.2006, LT, RL det. Wadi Bih (dam), 19.ii–29.iii.2007, LT; 24.iv–5.vi.2007, LT, RL det. Wadi Bih, 25.iii.2010, FB lgt., AC det. Wadi Madaq, 21.xii.2005–2.iii.2006, LT, RL det.; 23.iii.2010, 25.iii.2010, FB lgt., AC det. Wadi Safad, 21.ii–4.iii.2006, LT; 4.iii–4.v.2008, LT, RL det. Wadi Wurayah (farm), 13.i–2.iii.2009, MT, PK det. Wadi Wurayah (near waterfall), 24.ii.2005, HC, RL det.

Diagnosis: Body length 5.0–6.0 mm; hemelytral patterns vermiculate; male head with foveal depression large; male pala small, with single row of pegs; hind leg tarsus 2 infuscated; male asymmetry dextral, strigil very small. Distinguishing characters illustrated by Jansson (1986) and Kanyukova (2006).

Biology: In Europe it occurs in all types of stagnant and slowly running waters, being tolerant to salinity and pollution. In Near East common in pools, slowly flowing brooks and rivers. Commonly collected at lamps (Jaczewski, 1936; Linnavuori, 1986, 1994a, 2009; Kanyukova, 2006; this paper), in the UAE also in Malaise trap (this paper).

Distribution: Widely distributed in tropical Africa, entire Palaearctic Region, and India; in Arabian Peninsula recorded from Iraq, Jordan, Saudi Arabia and Yemen (Jansson, 1995; Katbeh et al., 2000; Fent et al., 2011). New to the United Arab Emirates.

Superfamily **Naucoroidea** Leach, 1815



Plates 6–7. 6: Irrigation canal along Wadi Madaq, hosting a rich population of *Sigara hoggarica* Poisson; 7: Wadi Madaq, 400 m a.s.l., habitat of *Anisops debilis debilis* Gerstäcker, *Sigara hoggarica* Poisson, and *Vallerioli assouanensis* (A. Costa). (Photographs by A. Carapezza)

Family **Naucoridae** Leach, 1815 (Creeping Water Bugs, Saucer Bugs)

Small to large bugs (5–21 mm). Body suboval to slightly elongate, flattened. Dorsal colouration in various shades of brown, often marked with yellowish tint. Eyes often overlapping antero-lateral angles of pronotum. Antennae 4-segmented, shorter than head, usually hidden below eyes. Rostrum 3-segmented, very short and stout. Fore legs raptorial, fore femora conspicuously enlarged; fore tarsus usually fused with tibia. Hind legs often modified for swimming. Membrane of forewing well developed, without venation. The habitats vary among subfamilies, but most species live in streams. Usually good swimmers (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Laccocorinae** Stål, 1876

Genus **Heleocoris** Stål, 1876

Heleocoris minusculus (Walker, 1870)

Plate 14

Specimens examined: Sharjah Desert Park, 1 ex., 29.xi.2006, HC, JG lgt., RL det. Wadi Fara (near al-Ghail), 266 m a.s.l., 1L, 17.iii.2007; 1♂, 28.ix.2007, JB & HP lgt., PK det. Wadi Hayl, 11 ex., 3.xii.2006, in water, JG lgt., RL det. Wadi Safad, 1♂, 4L, 28.xi.2006, in stream, JG lgt., RL det.; Wadi Safad, 130 m a.s.l., 1♂, 3L, 6.iii.2007, HC, AC lgt. & det. Wadi Shawkah, 1♂, 27.xi.2006, HC, JG lgt., RL det.; 5♂, 1♀, 4.ii.2010, in water stream, KM lgt., PK det.; 1♂, 1♀, 25.iii.2010, FB lgt., AC det.; 270 m a.s.l., 5♂, 1♀, 5.iii.2007, HC, AC lgt. & det. Wadi Shis, 1 ex., 3.xii.2006, in water, JG lgt., RL det. Wadi Wurayah, 22 ex., 26.xi.2006, in water, JG lgt., RL det.; 4♂, 6♀, 7L, 1.ii.2010; 1♂, 3L, 15.ii.2010, in water stream, KM lgt., PK det.; 210 m a.s.l., 1♂, 25.iii.2007, JB lgt., PK det.

Published record: 'Jebel Hafit' (Gillett & Howarth, 2004; van Harten, 2005).

Diagnosis: Body oval, dorso-ventrally flattened; body length 6.5–9.0 mm. Head yellowish with black spots between the dark brown eyes; thorax and hemelytra yellowish, pronotal disk, scutellum, endocorium and posterior part of exocorium more or less densely covered with black punctures, sometimes nearly black; membrane fuscous; legs and connexivum yellowish, rest of abdomen black. Fore tarsi not fused with tibia, with two claws. For identification see also Poisson (1962).

Biology: In lakes, shallow pools, permanent springs, brooks, rivers and irrigation dikes. Among submerged vegetation as well as in localities without vegetation (Brown, 1951; Linnavuori, 1986; Linnavuori & van Harten, 1997; Burt, 2003, as *Heleocoris* spec.). In the UAE collected in water streams and pools in dried-out wadis (Plates 12, 13) (this paper).

Distribution: Afrotropical Region, Sinai, Israel, Syria, Jordan, Saudi Arabia, Yemen, and Oman (Polhemus, 1995d; Katbeh et al., 2000; Burt, 2003, as *Heleocoris* sp.).

Superfamily **Notonectoidea** Latreille, 1802

Family **Notonectidae** Latreille, 1802 (Backswimmers)

Small to large aquatic bugs (3.4–18.0 mm) with characteristic boat-shaped body with strongly convex dorsal side. Antennae 2- to 4-segmented. Compound eyes large to very large, occupying most of the head. Rostrum 4-segmented, short and stout. Fore legs not raptorial; fore and middle legs adapted for grasping; hind legs oar-like, with fringes of long hairs on their tibiae and tarsi. Macropterous form predominant in most species. Membrane of hemelytra without veins, longitudinally subdivided in two parts disposed in a tent-like fashion over the back. Abdominal venter with a median longitudinal keel and heavy fringes of hairs medially and laterally forming plastron when submerged. Apex of abdomen and male genital segments symmetrical or nearly so. They differ from other aquatic insects (except Pleidae) in



Plates 8–11. 8: *Heliocorisa vermiculata* (Puton), male, Wadi Bih; 9: *Sigara (Sigara) assimilis* (Fieber), male, Wadi Madaq; 10: *Sigara (Tropicorixa) hoggarica* Poisson, male, Wadi Shawkah; 11: *Sigara (Vermicorixa) lateralis* (Leach), male, Wadi Madaq. (Photographs by A. Carapezza)

the habit of swimming on their backs. They are excellent swimmers and occur in a variety of freshwater habitats although the quiet waters of pools, ponds and lakes are preferred. All members of the family are predaceous (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Anisopinae** Hutchinson, 1929

Genus *Anisops* Spinola, 1837

Anisops debilis debilis Gerstaecker, 1873

Plate 15

Specimens examined: Fujairah, 1♀, 6.iv–2.vii.2005, LT, RL det. Between ad-Dhaid and Masafi, temporary pool along the road in the vicinities of 'Friday market', 1♀, 5L, 28.iii.2010, HC, FB lgt., AC det. Wadi Bih, 4♂, 2♀, 25.iii.2010, FB lgt., AC det. Wadi Madaq, 1♂, 27.iv–12.vi.2006, LT, PK det.; 380 m a.s.l., 2♀, HC, 7.iii.2007, AC lgt. & det. Wadi Shawkah, 1♂, 2♀, 22.ii.2010, in water stream, KM lgt., PK det.

Published records: 'Arabia: Oman, Ras-al-Khaima, 16.v.1949, 4♂, 4♀' (Brown, 1950, as *A. debilis*), 'Jebel Hafit' (Gillett & Howarth, 2004; van Harten, 2005, both as *A. debilis perplexa*).

Diagnosis: Body length 5.3–6.3 mm, maximum width 1.5–1.7 mm. Eyes, pronotum and scutellum greyish to pale yellow, hemelytra hyaline, of greyish appearance due to the underlying black body surface, abdominal venter dark brown or black. The outline of the head (viewed above) is rounded in both sexes. Synthlipsis narrow, between 1/4 and 1/5 (♂) and less than 1/3 (♀) of the anterior width of vertex. For illustrations of distinguishing characters see Brooks (1951) and Lansbury (1964).

Biology: Collected in various types of pools (muddy pools with little vegetation, pools in dry river beds) (Brown, 1951; Lansbury, 1962). In the UAE collected in temporary pool, in water stream and in rocky pools in a dried-out wadi (Plate 7); also in light traps (this paper).

Distribution: Tropical Africa, Algeria, Saudi Arabia, Yemen (Polhemus, 1995e). The record from Oman (Polhemus, 1995e) seems to refer to the United Arab Emirates (see Brown, 1950). Three additional subspecies are widely distributed in North Africa, Iberian Peninsula, Near East, and Socotra (Polhemus, 1995e). We expect the record of *A. debilis perplexa* (Gillett & Howarth, 2004) belongs to the nominotypical subspecies as well.

Anisops sardeus sardeus Herrich-Schaeffer, 1849

Plates 16–17

Specimens examined: Numerous specimens from the following localities: SSW of ad-Dhaid, 23.iv.2005, LT; 10–29.xii.2005, LT, RL det. Fujairah, 6.iv–2.vii.2005, LT, RL det. Hatta, 30.xi.2006, HC, JG lgt., RL det. Ra's al-Khaimah, 21.ii.2010, in standing water, KM lgt., RL det. Sharjah Desert Park, 30.iv–5.viii.2005, LT; 20.x–8.xi.2005, LT, RL det. Wadi Hayl, 29.xi.2006, HC, JG lgt., RL det. Wadi Safad, 31.i–21.ii.2006, LT; 14–21.v.2006, LT, RL det. Wadi Shawkah, 27–28.xi.2006, LT, JG lgt., RL det. Wadi Wurayah, 26.xi.2006, in water, JG lgt., RL det.

Diagnosis: Body length 7.0–8.5 mm, maximum width 1.8–2.0 mm. Body yellowish above, eyes brown, hemelytra may be hyaline and appear darker due to dark body surface, body venter blackish. Male vertex produced anteriorly into a prominent cephalic horn with acuminate apex, in female the outline of the head is rounded. In males synthlipsis narrow, ca. 1/6 of the anterior width of the vertex, in females wide, 1/3 of the anterior width of the vertex. For illustrations of distinguishing characters see Brooks (1951).

Biology: Inhabitant of various aquatic habitats, natural as well as man-made (pools, rivers, small man-made pools, swimming pools, fish-farm, old drainage canals) (Tawfik et al., 1986a; Linnavuori, 1994a, 2009; Linnavuori & Hosseini, 2000). Collected also in salty waters



Plates 12–13. 12: Wadi Safad, 130 m a.s.l., habitat of *Heleocoris minusculus* (Walker), *Neogerris parvulus* (Stål), and *Hydrometra maindroni* Hungerford & Evans; 13: Wadi Shawkah, 270 m a.s.l., locality of *Heleocoris minusculus* (Walker), *Neogerris parvulus* (Stål), *Metrocoris communis* (Distant), and *Valleriola assouanensis* (A. Costa). (Photographs by A. Carapezza)

(Kanyukova, 2006). Larvae develop in permanent waters. It prefers relatively clear water not densely covered with vegetation, while it was only scarcely found in highly polluted waters or among very dense vegetation (Tawfik et al., 1986a). In the UAE collected in stagnant waters (this paper). Also collected at light trap (Linnavuori & Hoseini, 2000; Kanyukova, 2006; this paper). Important predator of mosquito larvae; biology, egg and larval stages were described in detail by Tawfik et al. (1986b).

Distribution: Widely distributed in tropical and North Africa, southern Europe, Near East, Arabian Peninsula, Turkmenistan, India and Burma; recently found in Hungary, Romania, and North Caucasus, apparently spreading northwards (Polhemus, 1995e; Katbeh et al., 2000; Fent et al., 2011). New to the United Arab Emirates.

Subfamily **Notonectinae** Latreille, 1802

Tribe **Notonectini** Latreille, 1802

Genus ***Enithares*** Spinola, 1837

Enithares lineatipes Horváth, 1889

Plate 18

Specimens examined: Between ad-Dhaid and Masafi, temporary pool along the road in the vicinities of 'Friday market', 1♀, 28.iii.2010, HC, FB lgt., AC det. Wadi Shis, 1 ex., 1L, 3.xii.2006, in water, JG lgt., RL det. Wadi Wurayah, 1 ex., 1.ii.2010, in water stream, KM lgt., RL det.

Published record: 'Arabia: Oman, Ras-al-Khaima, 16.v.1949, 7♂, 7♀' (Brown, 1950; Lansbury, 1968).

Diagnosis: Body length 10.5–12.0 mm, maximum width 4.0–4.5 mm. Colouration variable, with whitish form, grey form, and dark form combining yellowish brown and black. Anterior part of pronotum strongly concave laterally. Distinguishing characters are illustrated by Lansbury (1968).

Biology: Found in pools and a small stream in India (Lansbury, 1968). In the UAE collected in a temporary pool as well as in a water stream (this paper).

Distribution: India, Pakistan, and the UAE; doubtfully recorded from China and Sumatra (Lansbury, 1968; Polhemus, 1995e). The record from Oman (Polhemus, 1995e) refers to the United Arab Emirates (cf. Brown, 1950; Lansbury, 1968).

Infraorder **Gerromorpha** Popov, 1971 (Semiaquatic Bugs)

Usually small to medium-sized, rarely large insects. Antennae longer than head, inserted in front of eyes and plainly visible from above. Dorsal head surface with three pairs of trichobothria (long slender setae inserted in deep cuticular pits) near inner margin of compound eyes. Fore wings, when present, lacking claval commissure and not divided into a well demarcated corium, clavus and membrane. Part or most of body always covered with a distinct layer of microtrichia. All species are predators. They inhabit the surface of both freshwater and saline waters; a few species live in humid terrestrial habitats and only two species are subaquatic (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Superfamily **Mesoveliioidea** Douglas & Scott, 1867

Family **Mesoveliidae** Douglas & Scott, 1867 (Water Treaders, Pondweed Bugs)

Small or very small bugs (1.2–4.4 mm), usually pale yellowish or brownish, with a greenish tinge when alive. Body surface with layer of microtrichia restricted to head and thorax. Head



Plates 14–18. 14. *Heleocoris minusculus* (Walker), male, Wadi Shawkah; 15: *Anisops debilis debilis* Gerstaecker, male, Wadi Bih; 16–17: *Anisops sardeus sardeus* Herrich-Schaeffer, 16 = male, Wadi Safad; 17 = female, SSW of ad-Dhaid; 18: *Enithares lineatipes* Horváth, female, Kalba. (Photographs by A. Carapezza [14, 15, 18] & P. Kment [16, 17])

longer than wide, porrect. Antennae long and slender, 4-segmented, sometimes flagelliform, with very long and slender distal segments. Ocelli present (macropterous adults of Mesoveliinae) or absent (apterous adults). Rostrum long and slender, basal segments of labium not obscured by bucculae. Pronotum of macropterous form truncate behind, meso-scutellum well developed and exposed. Pronotum of apterous form very short, exposing mesonotum, mesoscutellum not developed. Hemelytra with reduced venation, usually not extending on apical half. Legs inserted on thoracic sterna, close to the ventral midline of each segment; tarsi 3-segmented, claws of all legs inserted apically on last tarsal segment. Mesoveliidae live in marginal aquatic habitats, on water surfaces extensively covered with floating leaves of water plants, or humid terrestrial habitats (moss, litter) (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Mesoveliinae** Douglas & Scott, 1867

Genus *Mesovelia* Mulsant & Rey, 1852

Mesovelia vittigera Horváth, 1895

Plate 19

Specimens examined: Mahafiz, 1♂ (ma), 7–14.ix.2006, LT, RL det. Wadi Shawqah, 1♂ (ma), 27.xi.2006, HC, JG lgt., RL det.

Diagnosis: Body length 2.1–4.0 mm. Apterous specimens dorsally greenish without brown pattern, intersegmental sutures pale, not pigmented. Macropterous specimens with posterior part of pronotum and veins of hemelytra pale brown to brown. Hind margin of hind femora without black spines. Abdominal sternite VIII of males basally with a small median process bearing short stout black hairs and a tuft of pale longer hairs laterally on each side. Distinguishing characters are illustrated e.g. by Andersen & Weir (2004a,b) and Kanyukova (2006).

Biology: Found in a variety of freshwater habitats, chiefly in stagnant waters with plenty of vegetation along the edges, in permanent ponds, pools, marshes, brooks, canals, as well as in temporary pools and artificial reservoirs. There are also few records from brackish water and mangrove swamps (Jaczewski, 1936; Linnavuori, 1964, 1994a; Andersen & Weir, 2004b). In the UAE collected also in a light trap (this paper).

Distribution: Widely distributed in Afrotropical, Southern Palaearctic, Oriental, and Australian Region; in Arabian Peninsula recorded from Iraq, Jordan, Saudi Arabia, Yemen, and Oman (Andersen, 1995; Linnavuori & van Harten, 1997; Katbeh et al., 2000; Fent et al., 2011; B. Aukema, pers. comm.). New to the United Arab Emirates.

Superfamily **Hebroidea** Amyot & Serville, 1843

Family **Hebridae** Amyot & Serville, 1843 (Velvet Water Bugs)

Stout-bodied, small or very small bugs (1.3–3.7 mm). Body usually dull-coloured, densely covered with a velvety hydrofuge hair-pile. Adults usually macropterous or brachypterous, micropterous and apterous adults rare. Ocelli usually present. Antennae variable in length, usually slender, 4-segmented; segment 4 prolonged, often subdivided in middle by a membranous zone, appearing 5-segmented. Rostrum long and slender, resting in a groove on the underside of head and thoracic sternum; basal segments of labium obscured by a pair of plate-shaped bucculae. Pronotum of macropterous form emarginated behind; meso-scutellum exposed behind pronotum, forming a transverse plate; metanotum forming a subtriangular lobe behind that (commonly termed ‘scutellum’). Legs stout, not modified for rowing, equally

spaced on thorax, somewhat removed from the ventral midline of each segment; all tarsi 2-segmented, tarsal claws inserted apically. Forewing venation reduced distally, longitudinal veins enclosing 1–2 cells. They are primarily terrestrial, inhabiting moist microhabitats on banks of waters (humid litter, moss), marginal aquatic habitats (sphagnum bogs, sedge marshes), while some tropical representatives live on water surfaces covered with floating plants, sometimes entering the water; two species of the Oriental genus *Nieserius* Zettel, 1999, live subaquatic (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Hebrinae** Amyot & Serville, 1843

Genus *Hebrus* Curtis, 1833

Hebrus (Hebrus) pusillus arabicus Linnavuori, 1971

Plate 20

Specimens examined: Al-Ain, Green Mubarakat, 4 ex., 5.xii.2006, HC, JG lgt., RL det. Al-Ajban, 8 ex., 2-9.iv.2006; 1♀, 2.xii.2006, in water, JG lgt., RL det. Hatta, 3 ex., 30.v–19.vii.2006, LT, RL det. Sharjah Desert Park, 3 ex., 25.v–15.vii.2008, LT, RL det.; 2♂, 2♀, 2.iii–1.iv.2007, LT, PK det.; 1♂, 30.iv–21.v.2007, LT, PK det. Wadi Madaq, 1 ex., 6.v–12.vi.2006, LT, RL det. Wadi Safad, 4 ex., 28.xi.2006, in stream, JG lgt., RL det. Wadi Shawkah, 4 ex., 27–28.xi.2006, LT, JG lgt., RL det. Wadi Wurayah (farm), 1 ex., 1–8.iv.2009, LT, RL det.

Diagnosis: Body length 1.7 mm. Head and pronotum reddish brown, scutellum darker. Macropterous; corium dark brown, with a reddish brown longitudinal stripe; clavus reddish brown, base milky; membrane reddish brown becoming paler apically, with 3 obscure pale spots. Abdomen blackish brown, under surface otherwise reddish brown. Antennae and legs yellow brown. For identification see Linnavuori (1971, 1986).

Biology: Among vegetation in pools, evaporation lakes and irrigation dikes (Linnavuori, 1986, 1994a). In the UAE also collected by light traps (this paper).

Distribution: Known from Sudan, Iraq, Saudi Arabia, and Yemen (Andersen, 1995); the nominotypical subspecies, *H. p. pusillus* (Fallén, 1807) is widely distributed throughout Europe and across Russia up to the Far East, and also in North Africa (Kanyukova, 1997, 2006; Fent et al., 2011). New to the United Arab Emirates.

Superfamily **Hydrometroidea** Billberg, 1820

Family **Hydrometridae** Billberg, 1820 (Water Measurers, Marsh Treaders)

Slender-bodied, small to large bugs (2.7–22.0 mm). Body usually dull-coloured, densely covered with a velvety hydrofuge hair-pile. Adults usually macropterous or brachypterous, micropterous and apterous adults rare. Head more or less elongate, usually very slender, with the compound eyes distinctly removed from anterior margin of thorax. Ocelli usually absent. Antennae long, segments slender, in particular the two distal ones. Rostrum long and slender, basal segments of labium obscured by a pair of semicircular bucculae. Thorax more or less prolonged; pronotum posteriorly extended to cover mesonotum; metanotum usually exposed. Legs slender and long, equally spaced on thorax, inserted ventro-laterally or laterally on body; all tarsi 3-segmented, claws inserted apically. Abdomen usually long and slender. They live in humid terrestrial habitats (litter), marginal aquatic habitats, or on water surfaces covered with floating plants (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).



Plates 19–20. 19: *Mesovelia vittigera* Horváth, post-dispersion macropterous male with lost membrane, Wadi Shawkah; 20: *Hebrus (Hebrus) pusillus arabicus* Linnavuori, female, al-Ajban. (Photographs by P. Kment)

Subfamily **Hydrometrinae** Billberg, 1820

Genus *Hydrometra* Latreille, 1796

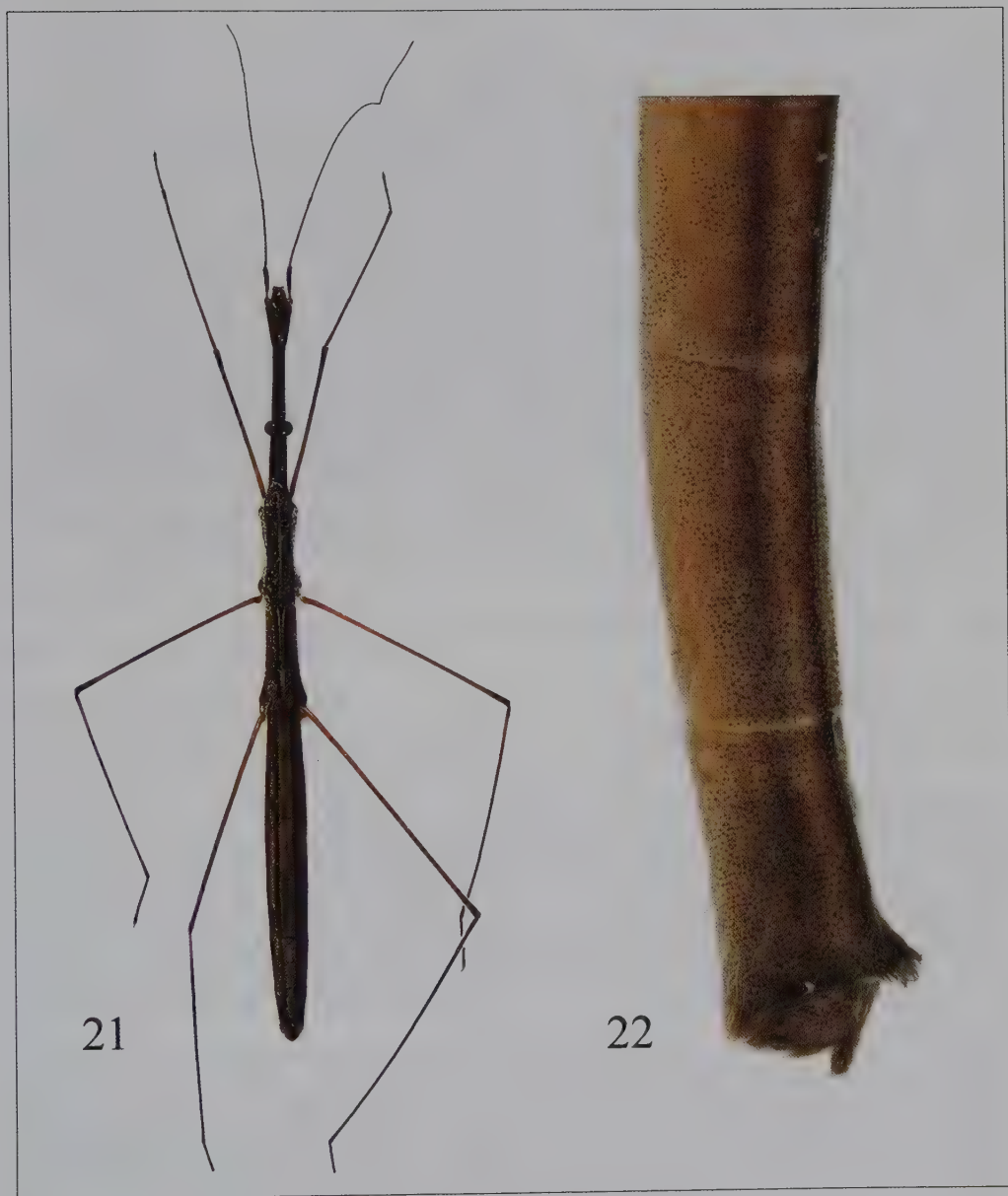
Hydrometra maindroni Hungerford & Evans, 1934

Plates 21–22

Specimens examined: Wadi Hayl, 1♀ (mi), 29.xi.2006, HC, JG lgt., RL det. Wadi Madaq, 1♀ (ma), 28.xi.2006, in pool, JG lgt., RL det. Wadi Safad, 130 m a.s.l., 1♂ (mi), 6.iii.2007, HC, AC lgt. & det.

Diagnosis: Body length (mm): 11.1–12.0 (♂, mi), 11.7–12.1 (♀, mi), 12.5 (♀, ma). mm. General colour of the body is medium to dark brown. In male there is a narrow median longitudinal white stripe on the pronotum, a faint white stripe extends along the sides of the body from the anterior margin of the pronotum to the posterior margin of the abdominal segment VI; the ventral parts of the body with frosted appearance. The female is similarly coloured except that the ventral part of the body is lighter brown and not frosted. Clypeus small and conical. For identification see Hungerford & Evans (1934).

Biology: So far unknown. In the UAE it was collected in pools in wadis (Plate 12); the specimen from Wadi Safad was collected among the vegetation bordering a small pool.



Plates 21–22. *Hydrometra maindroni* Hungerford & Evans. 21: Male, Wadi Safad (Photograph by A. Carapezza); 22: Female, apex of abdomen in lateral view, Wadi Hayl (Photograph by P. Kment).

Distribution: So far known only from one male and one female (both micropterous) collected in Muscat, Oman (Hungerford & Evans, 1934; Andersen, 1995). New to the United Arab Emirates.

Superfamily **Gerroidea** Leach, 1815

Family **Veliidae** Brullé, 1836 (Small Waterstriders or Watercrickets)

Generally small or very small bugs (1.0–10.5 mm) with relatively short thorax and robust legs. Entire body covered with layer of macro- and microhairs. Head rather short and broad, more or less deflected in front of the large, globular eyes, dorsally with a slender median impressed line. Ocelli absent. Antennal sockets usually ventrally of eyes and not visible from above. Antennae 4-segmented. Most species are wing dimorphic, with macropterous and apterous form. Pronotum often with collar and/or punctuated; in apterous form pronotum variable in length, in macropterous form large, pentagonal. Fore wings largely membranous, usually with three longitudinal, branching veins forming four closed cells. Metasternum with a midventral scent orifice and scent grooves leading laterally onto the metacetabula where they end in evaporatoria each provided with a tuft of hairs. Legs variable but typically rather short and robust; middle and hind coxae widely separated. Male fore tibia usually provided with a distal grasping comb composed of a row of minute, stout hairs. Number of tarsal segments variable (1–3), claws inserted preapically in a cleft on last segment. Abdomen variable in length. Inhabitants of freshwater bodies, both stagnant and flowing; a few groups have extended their habits to marine or terrestrial environment (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Microveliinae** China & Usinger, 1949 (1860)

Tribe **Microveliini** China & Usinger, 1949 (1860)

Genus **Microvelia** Westwood, 1834

Microvelia (*Picaultia*) **macani** Brown, 1953

Plate 27

Specimens examined: Numerous specimens (both macropterous and apterous) from the following localities: Al-Ajban, 25.iii–16.iv.2006, LT; 7.–27.xii.2006, LT, PK det. Fujairah, 6.iv–2.vii.2005, LT, RL det.; 8.iv–3.vi.2006, LT, PK det. Hatta, 21.vi–19.vii.2006, LT, RL det. Sharjah Desert Park, 30.iv–5.viii.2005, LT, RL det.; 2.iii–1.iv.2007, LT; 30.iv–21.v.2007, LT, PK det. NARC, near Sweihan, 14.iii–2.iv.2005, LT, RL det.; 30.i–26.ii.2006, LT, PK det. Wadi Bih (dam), 13–30.iv.2006, LT, PK det. Wadi Madaq, 11–18.vi.2006, LT, RL det.; 27.iv–12.vi.2006, LT, PK det.; 28.xi.2006, in pool, JG lgt., RL det. Wadi Safad, 17–24.vi.2006, LT, RL det. Wadi Shawkah, 4.ii.2010, in water stream, KM lgt., RL det. Wadi Wurayah (farm), 19.i–19.ii.2009, MT, PK det.

Diagnosis: Very small and gracile, body length 1.75 (macropterous form), 1.6–1.7 mm (apterous form); anterior pale band on pronotum broken in middle; connexivum uniformly yellowish; pronotum in macropterous form narrower, lateral margin conspicuously concave, humeral angles prominent; connexivum in apterous females overturned, covering part of tergum; comb of anterior male tibia shorter. For identification see Linnavuori (1986), Linnavuori & Hosseini (2000) and Saleh Ahmed & Gadalla (2005).

Biology: In pools and brooks among rich vegetation of *Phragmites*, *Juncus* and sedges, also in irrigation systems (Linnavuori, 1986, 1994a, 2009). Often among vegetation in the marshes, ponds and pools with clean shallow water (Saleh Ahmed & Gadalla, 2005). In the UAE collected in a pool and a water stream; also by light traps and Malaise trap (this paper).

Distribution: Known from Israel, Iraq, Saudi Arabia, Yemen (Andersen, 1995), Egypt, and Sinai (Saleh Ahmed & Gadalla, 2005). New to the United Arab Emirates.

Family **Gerridae** Leach, 1815 (Waterstriders, Pond Skaters)

Small to large true bugs (1.6–36 mm). Characterised by prolonged mesothorax combined with long and slender middle and hind legs which have their coxae inserted close to border between meso- and metathorax, widely separated, pointing almost directly backwards. Wing polymorphism is common, with apterous and macropterous forms predominant. The head is usually extended forward, with large, globular eyes; median impressed line and ocelli absent. Antennal sockets usually in front of eyes, visible from above. First antennal segment usually longer and somewhat stouter than remaining three segments. Pronotum without collar, never punctuated, in apterous form variable in length, in macropterous form large, pentagonal. Fore wings largely membranous, venation variable. Metasternal scent gland apparatus present or absent. All tarsi 2-segmented, claws inserted preapically in a cleft on last segment. Abdomen variable in length. They live in a variety of habitats, from stagnant freshwater pools and ponds, streams and rivers to various marine habitats, including the surface of the open ocean; few species are hygropetric. The pond skaters are conspicuous by their characteristic way of movement on the water surface upon which they ‘skate’ or ‘jump-and-slide’ (Schuh & Slater, 1995; Andersen & Weir, 2004a; Chen et al., 2005).

Subfamily **Gerrinae** Leach, 1815

Tribe **Gerrini** Leach, 1815

Genus **Neogerris** Matsumura, 1913

Neogerris parvulus (Stål, 1860)

Plates 23–24

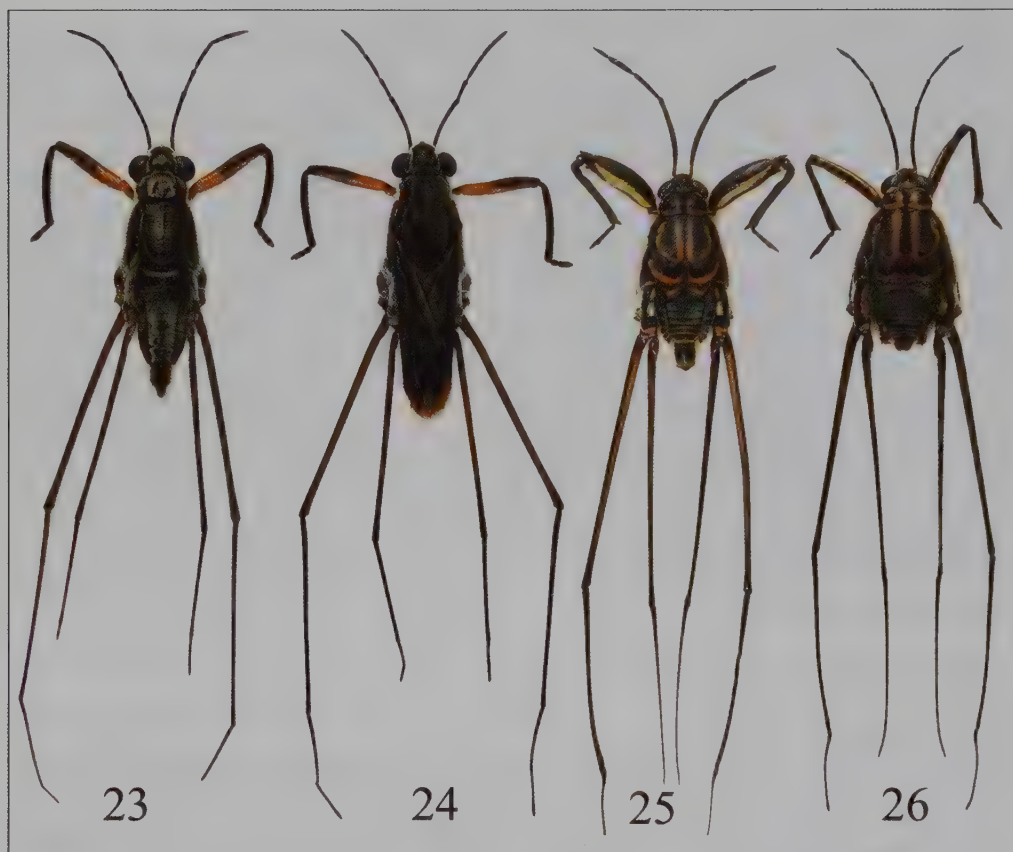
Specimens examined: 7 km S of al-Jazirat al-Hamra, 1 ex., 27.ii.2006, HC, RL det. Sharjah-Khor Kalba (near tunnel), 1 ex., 7–14.vi.2006, LT, RL det. Wadi Hayl, 6 ex., 29.xi.2006, HC; 1 ex., 3.xii.2006, in water, JG lgt., RL det.; Wadi Safad, 1 ex., 28.xi.2006, in stream, JG lgt., RL det.; 130 m a.s.l., 4♂, 6♀ (ap), 4L, 6.iii.2007, AC lgt. & det. Wadi Shawkah, 2 ex., 27–28.xi.2006, LT, JG lgt., RL det.; 5♂, 1♀ (ma), 1♂, 2♀ (ap), 22.ii.2010, in water stream, KM lgt., PK det.; 270 m a.s.l., 5♂, 3♀ (ma), 7♂, 5♀ (ap), 5.iii.2007, AC lgt. & det. Wadi Shis, 1 ex., 3.xii.2006, in water, JG lgt., RL det. Wadi Wurayah, 3 ex., 14.xi–4.xii.2006, MT, RL det.

Published records: ‘Arabia: Oman, Ras-al-Khaima, 16.v.1949, 4♂ (3 macropterous, 1 apterous), 11♀ (7 macropterous, 4 apterous)’ (Brown, 1950, as *Limnogonus parvulus*; Andersen, 1975, as *Neogerris parvula*); ‘Jebel Hafit’ (Gillett & Howarth, 2004; van Harten, 2005).

Diagnosis: Narrow species; body length 4.6–7.6 mm, width 1.4–2.4 mm (macropterous), 3.6–5.8 mm, width 1.4–2.1 mm (apterous). Black; head with an U-shaped brownish yellow band posteriorly; pronotum shiny, anteriorly with large, roundish to rectangular brownish yellow spot, posterior part pale emarginated; connexivum yellowish bordered; venter mostly pale yellowish with metathoracic scent gland orifice located in a black spot. Claws lost in middle legs. For identification see Andersen (1975), figures also in Chen et al. (2005).

Biology: Collected in irrigation systems in Saudi Arabia (Linnavuori, 1986). In the UAE collected in water streams and pools in drying-out wadis (Plates 12, 13) (this paper). Also collected at light (Fernando, 1964; this paper) and in a Malaise trap (this paper).

Distribution: Known from Oman, Saudi Arabia, United Arab Emirates, Iran, southern China, Taiwan, Japan, Oriental and Australian Region (Andersen, 1975, 1995). The record from Oman (Brown, 1950) refers to the United Arab Emirates, but its occurrence in Oman (Muscat) was confirmed by Andersen (1975).



Plates 23–26. 23–24: *Neogerris parvulus* (Stål), apterous male (23) and macropterous male (24) from Wadi Shawkah; 25–26: *Metrocoris communis* (Distant), apterous male (25) and apterous female (26) from Wadi Shawkah. (Photographs by A. Carapezza)

Subfamily **Halobatinae** Bianchi, 1896

Tribe **Metrocorini** Matsuda, 1960

Genus ***Metrocoris*** Mayr, 1865

Metrocoris communis (Distant, 1910)

Plates 25–26

= *Metrocoris omanensis* Brown, 1950 (syn. den Boer, 1965)

Specimens examined: Wadi Shawkah, 270 m a.s.l., 6♂, 8♀, 5.iii.2007, in a large rocky pool, HC, AC lgt. & det. Wadi Shis, 3 ex., 3.xii.2006, in water, JG lgt., RL det. Wadi Wurayah, 1 ex., 4.xii.2006, in pool or stream, JG lgt., RL det.

Published record: *Metrocoris omanensis*: ‘Arabia: Oman, Ras-al-Khaima, 16.v.1949, 5♂ (holotype and 4 paratypes), 16♀ (allotype and 15 paratypes) (coll. G. Popov)’ (Brown, 1950; den Boer, 1965; Linnavuori, 1994a).

Diagnosis: Apterous, wide species; body length 4.5–5.8 mm, width 2.67–3.2 mm. Black, with specific dull pale yellow markings on dorsum of the body; surface rather dull, scarcely

shining. For illustrations of the distinguishing characters see Brown (1950, as *M. omanensis*), den Boer (1965), and Chen & Nieser (1993).

Biology: Collected in a brook with gravelly bottom in Iraq (Linnavuori, 1994a) as well as in small rocky streams in India (den Boer, 1965). In the UAE collected in water streams and pools in drying-out wadis (Plate 13) (this paper).

Distribution: Known from Iraq, Iran, Afghanistan, and India (Andersen, 1995). The records of the species from Oman (Andersen, 1995) refer either to the United Arab Emirates (cf. Brown, 1950, as *M. omanensis*; Chen & Nieser, 1993) or India: Maharashtra (Chen & Nieser, 1993: Medha, Yenna Valley, Satara dist.).

Infraorder **Leptodomorpha** Popov, 1971

Very small to medium-sized bugs. They vary in shape from nearly globose, to weakly flattened and ovoid, or to elongate and parallel-sided. Head usually relatively short and broad. Dorsal head surface without three pairs of trichobothria (long slender setae inserted in deep cuticular pits) near inner margin of compound eyes; the eyes usually very large, occupying nearly entire side of head. Antennae 4-segmented, well-visible from above, slender, segment 1 short, segments 2–4 longer. Fore wings in the form of hemelytra with a conspicuously coriaceous anterior portion and membranous posterior region, membrane usually with 3, 4 or 5 closed cells in macropterous forms. All species are predatory. Most species inhabit damp areas adjacent to water, some of the species are intertidal (Schuh & Slater, 1995).

Superfamily **Saldoidea** Amyot & Serville, 1843

Family **Saldidae** Amyot & Serville, 1843 (Shore Bugs)

Small to medium-sized, body length 2.3–7.4 mm. Usually ovoid in outline, dark brown or blackish species with light spots on hemelytra. Compound eyes large, reniform, reaching posteriorly only to level of pronotal collar or very slightly beyond. Ocelli not situated on a tubercle. Labium long, tapering, nearly reaching onto abdomen, segment 1 greatly reduced, segment 3 much longer than either segment 2 or 4. Pronotum with distinctly elevated callar area. Membrane with 4 or 5 closed cells. Subcostal region of the forewing in female modified to accommodate abdominal grasping apparatus of male, which has form of a well developed peg plate on laterotergite 3. Legs and other parts of body not spinose. Extremely agile through a combination of jumping and flight, predators of small invertebrates. Most temperate-region shore bugs are associated with damp substrates along the margins of ponds and streams; some species are fully terrestrial and not associated with water bodies. Some tropical species are saxicolous, and several species are adapted to intertidal habitats of sea coasts (Schuh & Slater, 1995).

Subfamily **Chiloxanthinae** Cobben, 1959

Genus **Pentacora** Reuter, 1912

Pentacora sphacelata (Uhler, 1877)

Plate 28

Specimens examined: Fujairah, 2♂, 8.iv–3.vi.2006, LT, PK det. Sharjah Desert Park, 9 ex., 30.iv–5.viii.2005, LT; 25.iii–28.v.2007, LT, RL det. Wadi Bih (dam), 3 ex., 24.iv–5.vi.2007, LT; 28.v–15.vii.2006, LT, RL det.; 1♂, 1♀, 13.xii.2009–8.iii.2010, WT, PK det.

Diagnosis: Body length 4.0–5.1 mm. Macropterous, slender. Mostly brownish yellow, slightly shiny, with regular, short, adpressed dark pilosity; vertex, callar region of pronotum,



Plates 27–28. 19. *Microvelia (Picaultia) macani* Brown, female, Fujairah; 24: *Pentacora sphacelata* (Uhler), male, Sharjah Desert Park. (Photographs by P. Kment)

and scutellum black. Head as wide as anterior pronotal margin. Veins on membrane enclosing five cells, sublateral cell ending contiguous with the neighbouring cells. For identification see Cobben (1960) and Péricart (1990).

Biology: Eulittoral, marine-euhaline species. It lives mostly in muddy sea coasts and in mangroves, but it can occur also in other habitats (sand beaches, salt meadows). When disturbed it can escape on water surface (Bahr & Schulte, 1976; Péricart, 1990). In the UAE collected by light and water (= pan) traps (this paper).

Distribution: Iberian Peninsula, Morocco, Sardinia; Nearctic and Neotropical Region (Lindskog, 1995). New to the United Arab Emirates.

Subfamily **Saldinae** Amyot & Serville, 1843

Tribe **Saldoidini** Reuter, 1912

Genus ***Micracanthia*** Reuter, 1912

Micracanthia ornatula (Reuter, 1881)

Plates 29–30

Specimens examined: Numerous specimens from the following localities: Al-Ajban, 25.iii–16.iv.2006, LT, PK det. Fujairah, 24.ii–2.vii.2005, LT; 8–29.iv.2006, LT, RL det.; 8.iv–3.vi.2006, LT, PK det. Khor al-Khwair, 8.iii–2.iv.2007, LT, PK det. Sharjah Desert Park, 29.iii–5.viii.2005, LT; 30.iv–21.v.2007,



Plates 29–30. *Micracanthia ornatula* (Reuter), male (29) and female (30) from Wadi Madaq. (Photographs by A. Carapezza)

LT, PK det.; 11.xii.2008–6.i.2009, RL det.; 2.iii–1.iv.2009, LT, PK det. NARC, near Sweihan, 14.iii–2.iv.2005, LT, RL det. Wadi Bih (dam), 19.ii–28.iii.2007, LT, RL det. Wadi Madaq, 27.iv–12.vi.2006, LT, PK det.; 380 m a.s.l., 7.iii.2007, on rocks along a mountain water stream, HC, AC lgt. & det. Wadi Safad, 21.ii–4.iii.2005, LT, RL det. Wadi Wurayah (farm), 1–8.iv.2009, LT+MT, RL det.

Diagnosis: Body length 2.7–3.3 mm. Pronotum and scutellum only slightly shiny, with dense adpressed silvery white pilosity. Head (except pale clypeus and labrum), pronotum, scutellum, clavus (except small pale oval spot posteriorly), and most of endocorium black; exocorium mostly ivory, medially more or less interrupted by black. Anterior margin of pronotum not wider than pronotal collar, lateral margins of pronotum straight. For identification see Cobben (1960, as *Saldula ornatula*).

Biology: On shores of freshwaters as well as brackish ones (Cobben, 1960). In the UAE it was collected on rocks along a mountain water stream (Plate 31); also in light traps (this paper).

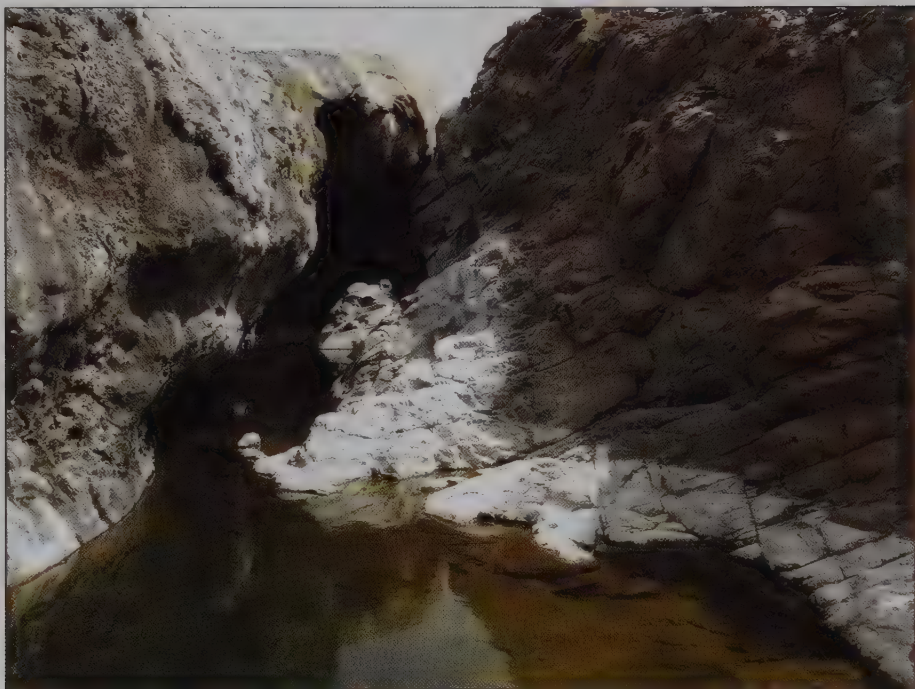


Plate 31. Pool among rocks along Wadi Maidaq, habitat of *Micracanthia ornatula* (Reuter). (Photograph by A. Carapezza)

Distribution: Widely distributed in Egypt, Saudi Arabia, Yemen, Oman, Iran, southern China, Taiwan, Korea, Japan, Afrotropical, Oriental and Australian Region, and south-west Pacific (Lindskog, 1995; Linnavuori & van Harten, 2002; Linnavuori, 2004b). New to the United Arab Emirates.

Genus *Saldula* Van Duzee, 1914

***Saldula palustris pallidipennis* (Reuter, 1888)**

Plate 32

Specimens examined: Fujairah, 1♂ (genitalia dissected), 6.iv–2.v.2005, LT, '*Saldula pallipes pallidipennis* (Reuter) det JTP[olhemus] 2006'.

Diagnosis: Body length 2.95–3.80 mm. Pronotum and scutellum shiny. Head (except pale clypeus), pronotum, scutellum, and clavus (except for a large pale drop-shaped spot posteriorly) black; corium ivory except the black basal angle or with scattered black spots. Anterior margin of pronotum wider than pronotal collar. For identification see Cobben (1960) and Lindskog & Polhemus (1992).

Biology: On salt marshes (Lindskog & Polhemus, 1992), also collected in moist localities with *Juncus*, *Phragmites* and sedges on shores of brooks (Linnavuori, 2009). Also collected by light traps (Linnavuori, 1994a; this paper).

Note: *Saldula pallidipennis* was synonymized with *S. palustris* (Douglas & Scott, 1874) by Cobben (1959) regarding it as falling within infraspecific variability. Lindskog & Polhemus (1992) considered *S. pallidipennis* as the smallest and most light coloured extreme form of *S. palustris* and its synonym, which is accepted by Lindskog (1995). However, according to

J.T. Polhemus (in litt. to RL), *S. pallidipennis* is actually a valid subspecies of *S. pallipes*, but this taxonomic change has not been formally published yet (cf. Linnavuori, 2009).

Distribution: Distributed in the desert zones of Middle Asia (Irano-Turanian subregion) and North Africa and some other southern lowland areas (Lindskog & Polhemus, 1992; Linnavuori, 1994a). New to the United Arab Emirates.

Superfamily **Leptopodoidea** Brullé, 1836

Family **Leptopodidae** Brullé, 1836 (Ghost Bugs)

Small to medium-sized, body length 1.8–7.0 mm. Compound eyes protruding, nearly hemispherical; ocelli proximate to one another, situated on a prominent tubercle. Labium 4-segmented, short, at most reaching to apex of fore coxae. At least clavus, and sometimes most of dorsum, deeply and densely punctured. Antennae very slender, almost thread-like. Legs gracile. Fore femora and often dorsum with very long setae or heavy cuticular spines. Abdominal grasping apparatus present but without pegs. Very active and agile, readily taking flight. Predators. Saxicolous, living on vertical rock surfaces around the shores of ponds and streams or found under stones in screes or in other dry situations some distance from water (Schuh & Slater, 1995).

Subfamily **Leptopodinae** Brullé, 1836

Tribe **Leptopodini** Brullé, 1836

Genus *Erianotus* Fieber, 1860

Erianotus lanosus (Dufour, 1834)

Plate 33

Specimen examined: Wadi Bih (dam), 1♀, 30.v–5.vi.2007, LT, RL det.

Diagnosis: Body length 4.5–4.75 mm. Segment 2 at least four times longer than segment 1. Upper surface with dense erect long hair covering. Opaque, blackish; apex of head, basal margin of pronotum narrowly, exocorium, legs and most of body venter pale. Antennae pale yellow, segment 4 blackish. Clavus and endocorium black with whitish spots (West Mediterranean) to whitish-brown with brown spots (East Mediterranean, Plate 33). Membrane pale brownish, veins brown. For identification see Péricart (1990) and Linnavuori & Hosseini (2000).

Biology: Ripicolous species, occurring among sunlit stones along streams, but found also in waterless salty area in southern Iran (Hoberlandt, 1983; Péricart, 1990). Our UAE specimen was collected by a light trap near a dam (this paper).

Distribution: Distributed in north-western Africa, Hungary, southern Europe, Transcaucasia, Turkey, Cyprus, Israel, Syria, Iraq, Iran, Afghanistan, Central Asia, and Mongolia (Lindskog, 1995). New to the United Arab Emirates.

Genus *Valleriola* Distant, 1904

Valleriola assouanensis (A. Costa, 1875)

Plate 34

Specimens examined: Wadi Bih (dam), 10 ex., 24.iv–23.v.2007, LT; 30.v–5.vi.2007, LT; 30.iv–4.vi.2008, LT, RL det. Wadi Maidaq, 1 ex., 27.iv–14.v.2009, WT, RL det.; 380 m a.s.l., 1♀, 7.iii.2007, HC, AC lgt. & det.. Wadi Shawkah, 5 ex., 1–7.iv.2007, WT; 2.i–18.ii.2008, WT, RL det.; 270 m a.s.l., 1♂, 3♀, 5.iii.2007, on rocks, HC, AC lgt. & det.; 1♂, 250–280 m a.s.l., 26.iii.2007, JB lgt., PK det. Wadi Wurayah env., 210 m a.s.l., 1♂, 25.iii.2007, JB lgt., PK det.



Plates 32–34. 32: *Saldula palustris pallidipennis* (Reuter), male, Fujairah; 33: *Erianotus lanosus* (Dufour), female, Wadi Bih (dam); 34: *Valleriola assouanensis* (A. Costa), female, Wadi Shawkah. (Photographs by P. Kment (27, 28) and A. Carapezza (29))

Diagnosis: 4.7–6.3 mm. Bucculae, rostral segment 1, and tibiae pale. Posterior lobe of pronotum black except on median line, lateral and posterior margins testaceous. Hemelytra blackish brown with two pale spots, one medially, the second at the apex of corium, each of them divided by black longitudinal vein; coastal margin of hemelytron pale. Antennal segment 3 twice as long as segment 2. Legs very long; entire length of anterior tibia with numerous very short spines in one densely packed regular row. For identification see Horváth (1911).

Biology: Collected on large stones among the numerous water pools on the bottom of deep canyons with clayish slopes, as well as on stony banks of a brook in a very large open valley, always in rather hot conditions (day temperatures over 50°C) (Hoberlandt, 1983). In the UAE collected on rocks covered with filamentous green algae (see left side of Plate 7), and rocky as well as gravelly banks of drying-out wadis (Plates 7, 13); also in light traps and water (= pan) traps (this paper).

Distribution: Egypt, Israel, Iran, Afghanistan, Oriental and Afrotropical Region (Lindskog, 1995). New to the United Arab Emirates.

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Authors' addresses:

- R. Linnavuori, Saukkokuja 10, FIN-21220 Raisio, Finland; e-mail: rauno.linnavuori@kolumbus.fi
- P. Kment, Department of Entomology, National Museum, Kunratic 1, CZ-148 00 Praha 4, Czech Republic; e-mail: sigara@post.cz
- A. Carapezza, Via Sandro Botticelli, 15, I-90144 Palermo, Italy; email: carapezz@unipa.it

Order Hemiptera, family Issidae

Vladimir M. Gnezdilov & Michael R. Wilson

INTRODUCTION

The planthopper family Issidae is a worldwide distributed group with 973 extant species in 155 genera arranged in 4 tribes (Gnezdilov, 2003a, 2009, 2010). Only the tribe Issini with 3 genera and 5 species (including the species described below), is known from the Arabian Peninsula. The genus *Caepovultus* Gnezdilov & Wilson, 2007, was erected for a single species from Oman (Gnezdilov & Wilson, 2007). A further species, described here, was found during fieldwork in 2010. *Caepovultus* may be treated as endemic genus of the Peninsula. The genus *Caepovultus* is closely related to the genus *Quadriwa* Ghauri, 1965, which is mostly distributed in Iran. Both species of *Caepovultus* inhabit mountain biotopes (Plate 1). Two other issid genera known from the Arabian Peninsula, *Kovacsiana* Synave, 1956, and *Kivupterum* Dlabola, 1985, are also recorded from Africa.

MATERIALS AND METHODS

Morphological terminology follows Emeljanov (1995) and Gnezdilov (2003b). The genital segments of the examined specimen were macerated in 10% KOH and figured in glycerine jelly using compound light microscope Mikmed-1. Photographs of the specimen were made using Leica MZ95 with Leica video camera DFC290, images are produced using the software Helicon Focus 4.61 and Photoshop. The single specimen was found by vacuum sampling using a modified petrol leaf blower/sucker.

The type specimen of the new species is deposited in the Hemiptera collection of the National Museum of Wales (NMWC, Cardiff, UK).

Key to the issid genera of the Arabian Peninsula

- 1 Bifurcation of radial vein on fore wings starts almost from the basal cell, median simple, cubitus anterior bifurcate *Caepovultus* Gnezdilov & Wilson, 2007
- Bifurcation of radial vein on fore wings starts from the common stem on a distance from the basal cell, median tri-hexafurcate, cubitus anterior simple **2**
- 2 Sublateral carinae of metope are joined below its upper margin. Fore wings without hypocostal plate. Hind wings reaching genital segments *Kovacsiana* Synave, 1956
- Sublateral carinae of metope are joined at its upper margin. Fore wings with hypocostal plate. Hind wings rudimentary *Kivupterum* Dlabola, 1985

List of issid species known from the Arabian Peninsula

Caepovultus deemingi Gnezdilov & Wilson, 2007: Oman (Gnezdilov & Wilson, 2007).

Caepovultus nov. spec.: United Arab Emirates.

Kovacsiana abyssinica Synave, 1956: Ethiopia, Yemen (Synave, 1956; Linnavuori, 1970).

Kovacsiana khamis (Dlabola, 1979): Saudi Arabia (Dlabola, 1979).

Kivupterum saudicum (Dlabola, 1979): Saudi Arabia (Dlabola, 1979).



Plate 1. View of Jebel Jibir, type locality of *Caepovultus vegrandis* nov. spec. (Photograph © V.M. Gnezdilov)

SYSTEMATIC ACCOUNT

Family **Issidae** Spinola, 1839

Subfamily **Issinae** Spinola, 1839

Tribe **Issini** Spinola, 1839

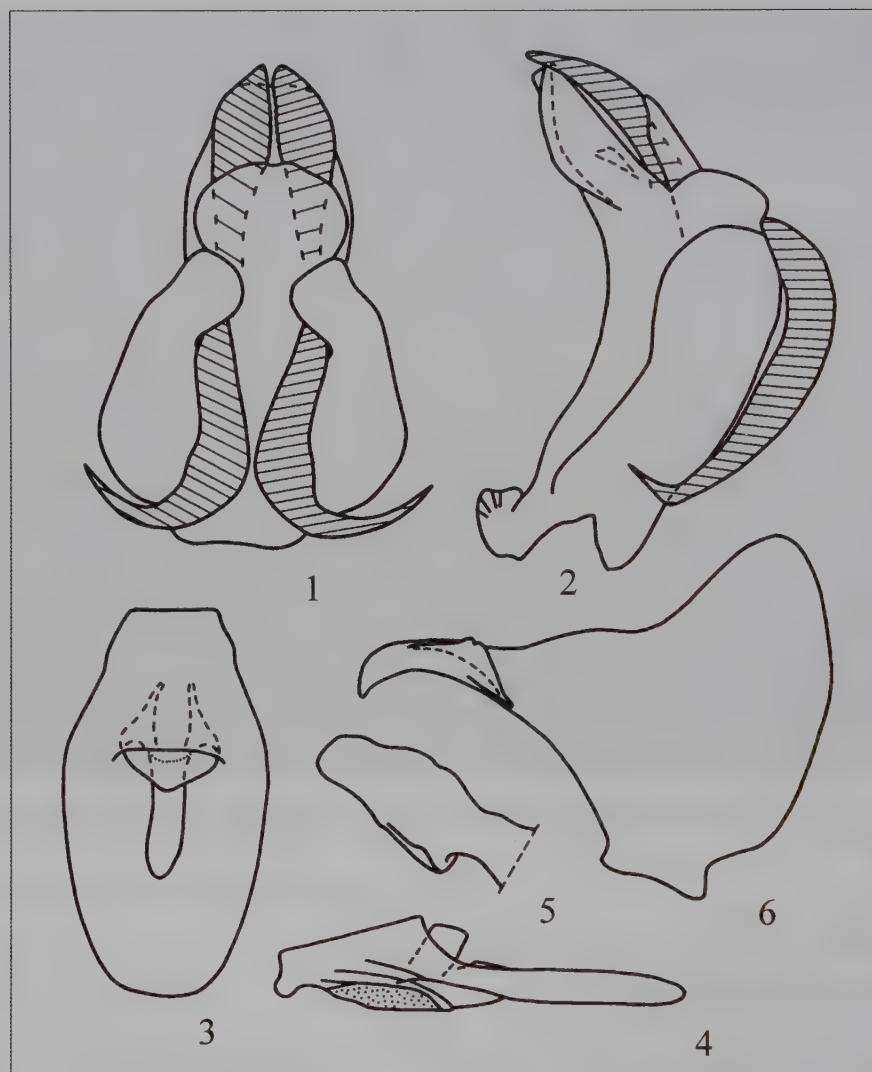
Genus *Caepovultus* Gnezdilov & Wilson, 2007

Caepovultus vegrandis Gnezdilov & Wilson **nov. spec.**

Plates 2–4, Figures 1–6

Specimens examined: Holotype: ♂, labelled: “U.A.E.: Jebel Jibir, 1272 m, 25°38'225''N 56°06'885''E, 08.iv.2010, leg. M. Wilson”.

Description: Metope elongate, weakly enlarged above clypeus, with distinct median carina reaching from its upper margin through postclypeus and sublateral carinae joined below its upper margin and not reaching metopoclypeal suture (Plate 4). Median and sublateral carinae of metope are joined at acute angle below its upper margin. Pedicel cylindrical, with sensory organs. Rostrum reaching hind coxae. Coryphe almost square, with keel-shaped lateral margins, anterior margin acutely angulate, posterior margin angularly concave (Plate 3).



Figures 1–6. *Caepovultus vegrandis* nov. spec. Male genitalia. 1: Penis, ventral view; 2: Penis, lateral view; 3: Anal tube, dorsal view; 4: Anal tube, lateral view; 5: Capitulum of style, dorsal view; 6: Style, lateral view.

Pronotum with large median tubercle below acutely angulate, keel-shaped anterior margin, posterior margin weakly concave. Mesonotum with weak lateral carinae. Fore wings nearly oval, without hypocostal plate (Plate 2). Longitudinal veins of fore wings keel-shaped, transverse veins are distinct only in distal part of the wings. Radius bifurcate (bifurcation starts almost from the basal cell), mediana simple, cubitus anterior bifurcate (R 2 M 1 CuA 2). Clavus long, 0.65 as long as whole wing. Hind wings as long as fore wings. Hind tibia with single lateral spine distally. First metatarsomere with 4 intermediate spines.



Plates 2–4. *Caepovultus vegrandis* nov. spec., habitus. 2: Lateral view; 3: Dorsal view; 4: Frontal view.

General coloration light brown yellowish. Metope dark brown in its upper part excluding light carinae, with two dark brown longitudinal stripes between sublateral carinae in its lower part. Postclypeus dark brown excluding light median carina and two large light spots latero-basally. Anteclypeus dark brown. Rostrum with black apex. Coryphe with two large oval dark

brown patches besides of median line. Paradiscal fields of pronotum, apices of third metatarsomeres, and claws dark brown. Mesonotum with dark brown apical angles. Fore wings with sparse dark brown spots. Hind wings gray. Femora and tibiae with dark brown stripes and spots. Spines of legs black. Abdominal sternites and tergites dark brown excluding light brown yellowish hind margins.

Male genitalia (Figs 1–6). Pygofer with weakly convex hind margin. Anal tube elongate, narrow basally, weakly truncate apically (Fig. 3). Anal column long, 0.3 as long as anal tube, narrow. Phallobase weakly curved (in lateral view) (Fig. 2), wide basally (in dorsal view) (Fig. 1). Dorso-lateral phallobase lobes narrowing apically, fused dorsally, each with two semicircular processes – one subapical and one above ventral aedeagal hooks (Fig. 2). Ventral phallobase lobe enlarged above the aedeagal hooks, with apical notch (Fig. 1). Apical aedeagal processes long, wide, narrowing apically, its apices are visible above apical phallobase margin (Fig. 2). Ventral aedeagal hooks long, wide, acute apically. Style with concave hind margin (Fig. 6). Capitulum of style on short neck, long, rounded apically (in dorsal view) (Fig. 5), lateral tooth wide.

Total length: 3.1 mm.

Etymology: The specific name means ‘diminutive’, ‘small’, ‘tiny’ in Latin, referring to the smaller size of the new species when compared with *C. deemingi*.

Key to the species of *Caepovultus*

- 1 General colouration light brown yellowish. Metope weakly enlarged above clypeus. Hind tibia with single lateral spine. Each dorso-lateral phallobase lobe with subapical semicircular process. Ventral phallobase lobe enlarged above the aedeagal hooks *C. vegrandis* Gnezdilov & Wilson nov. spec.
- General colouration brown. Metope narrow apically and distinctly enlarged above clypeus. Hind tibia with 2 lateral spines. Dorso-lateral phallobase lobes without such processes. Ventral phallobase lobe not enlarged above the aedeagal hooks *C. deemingi* Gnezdilov & Wilson, 2007

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Authors' addresses:

Dr. V.M. Gnezdilov, Zoological Institute of the Russian Academy of Sciences, Universitetskaya nab. 1, St. Petersburg 199034, Russia; e-mail: vmgnezdilov@mail.ru, vgnezdilov@zin.ru

Dr. M.R. Wilson, National Museum of Wales, Cathays Park, Cardiff CF10 3NP, UK; e-mail: Michael.Wilson@museumwales.ac.uk

Order Hemiptera, family Caliscelidae

Vladimir M. Gnezdilov & Michael R. Wilson

INTRODUCTION

The family Caliscelidae Amyot & Serville, 1843, is distributed worldwide and comprises two subfamilies – Caliscelinae Amyot & Serville, 1843, with two tribes (Caliscelini Amyot & Serville, 1843; Peltonotellini Fieber, 1872) and Ommatidiotinae Fieber, 1875, with three tribes (Ommatidiotini Fieber, 1875; Augilini Baker, 1915; Adenissini Dlabola, 1980) (Emeljanov, 1999, 2008; Gnezdilov, 2008; Gnezdilov & Wilson, 2006). The tribe Peltonotellini was recently revalidated by Emeljanov (2008) who suggested including in the tribe calisceline genera with sensory pits in imago and listed four genera: *Peltonotellus* Puton, 1886; *Acromega* Emeljanov, 1996; *Ceragra* Emeljanov, 1996; *Mushya* Kato, 1933. Judging on the presence of sensory pits in the imago, the genus *Homaloplasis* Melichar, 1906, also belongs to this tribe.

In the Arabian Peninsula the subfamily Caliscelinae is represented by the tribe Peltonotellini, with monotypical genus *Homaloplasis* Melichar, 1906 (Gnezdilov & Bourgoin, 2009) and the subfamily Ommatidiotinae Fieber is represented by the tribe Adenissini Dlabola, 1980 (subtribe Adenissina), with two genera – *Adenissus* Linnavuori, 1973 and *Perissana* Metcalf, 1952 (subgenus *Raunolina* Gnezdilov & Wilson, 2006) (Gnezdilov & Wilson, 2006). *Homaloplasis aprica* Melichar, 1906, is recorded from Saudi Arabia, Algeria, Tunisia, and Mali (Melichar, 1906; Dlabola, 1983; Gnezdilov & Bourgoin, 2009).

The genus *Adenissus* Linnavuori comprises 6 species. The type species of the genus, *Adenissus brachypterus* Linnavuori, 1973, was described from South Yemen (Linnavuori, 1973). A further species, *A. riadicus* Dlabola, 1985, was described from Eastern Saudi Arabia (Haradh) and recorded from UAE and Oman (Dlabola, 1985; Gnezdilov et al., 2004; Gnezdilov & Wilson, 2006). Four other species are distributed in Iran (Dlabola, 1980).

The genus *Perissana* Metcalf, 1952, comprises two subgenera: *Perissana* Metcalf, 1952, and *Raunolina* Gnezdilov & Wilson, 2006. The nominative subgenus includes three species distributed in Iran, Iraq, and Azerbaijan (Gnezdilov & Wilson, 2006). The subgenus *Raunolina* includes two species, one of them is known from Israel and Egypt and the other, *Raunolina arabica* Gnezdilov & Wilson, 2006, from Saudi Arabia.

The subtribe Bocrina Emeljanov, 1999, is closely related to the subtribe Adenissina Dlabola and is known from a single species, *Bocra ephedrina* Emeljanov, 1999, from the mountain regions of Tadzhikistan where it occurs on *Ephedra* spp. (Ephedraceae) (Emeljanov, 1999).

MATERIALS AND METHODS

Morphological terminology follows Emeljanov (1995) and Gnezdilov (2003). *Calligonum crinitum arabicum* was identified using the guide by Jongbloed (2003). The genital segments of the examined specimens were macerated in 10% KOH and figured in glycerine jelly using a compound light microscope Leica M165 C. Photographs of the specimen were made using a Leica MZ95 microscope with a Leica video camera DFC290; images are produced using the software Helicon Focus 4.61 and Photoshop.

The recent material is divided between the Zoological Institute of the Russian Academy of Sciences (ZIN, St. Petersburg, Russia), the Hemiptera collection of the National Museum of Wales (NMWC, Cardiff, UK) and the UAE Invertebrate Collection. The holotype of

Adenissus brachypterus is in the American Museum of Natural History (AMNH, New York, USA).

SYSTEMATIC ACCOUNT

Key to the genera of Caliscelidae occurring in the Arabian Peninsula

- 1 Metope, lateral parts of pronotum, scutellum, and abdominal tergites excluding genital segments with developed sensory pits. Lower part of metope and whole postclypeus form wedge-shaped proboscis flattened dorso-laterally *Homaloplasis* Melichar
- Head and body without sensory pits. Metope and postclypeus without proboscis (Plate 4) 2
- 2 Metope wide, upper margin concave, sublateral carina are subparallel, not joined apically. Fore wings with hypocostal plate, claval suture visible proximally. Hind margin of pygofer with hook-shaped process subapically. Suspensorium with awl-shaped process. Aedeagus without ventral hooks *Adenissus* Linnavuori
- Metope narrow, upper margin straight, sublateral carina joined at its upper margin. Fore wings without hypocostal plate, claval suture invisible. Hind margin of pygofer without hook-shaped process. Suspensorium without awl-shaped process. Aedeagus with pair of ventral hooks *Perissana* Metcalf (subgenus *Raunolina* Gnezdilov & Wilson)

Subfamily **Ommatidiotinae** Fieber, 1875

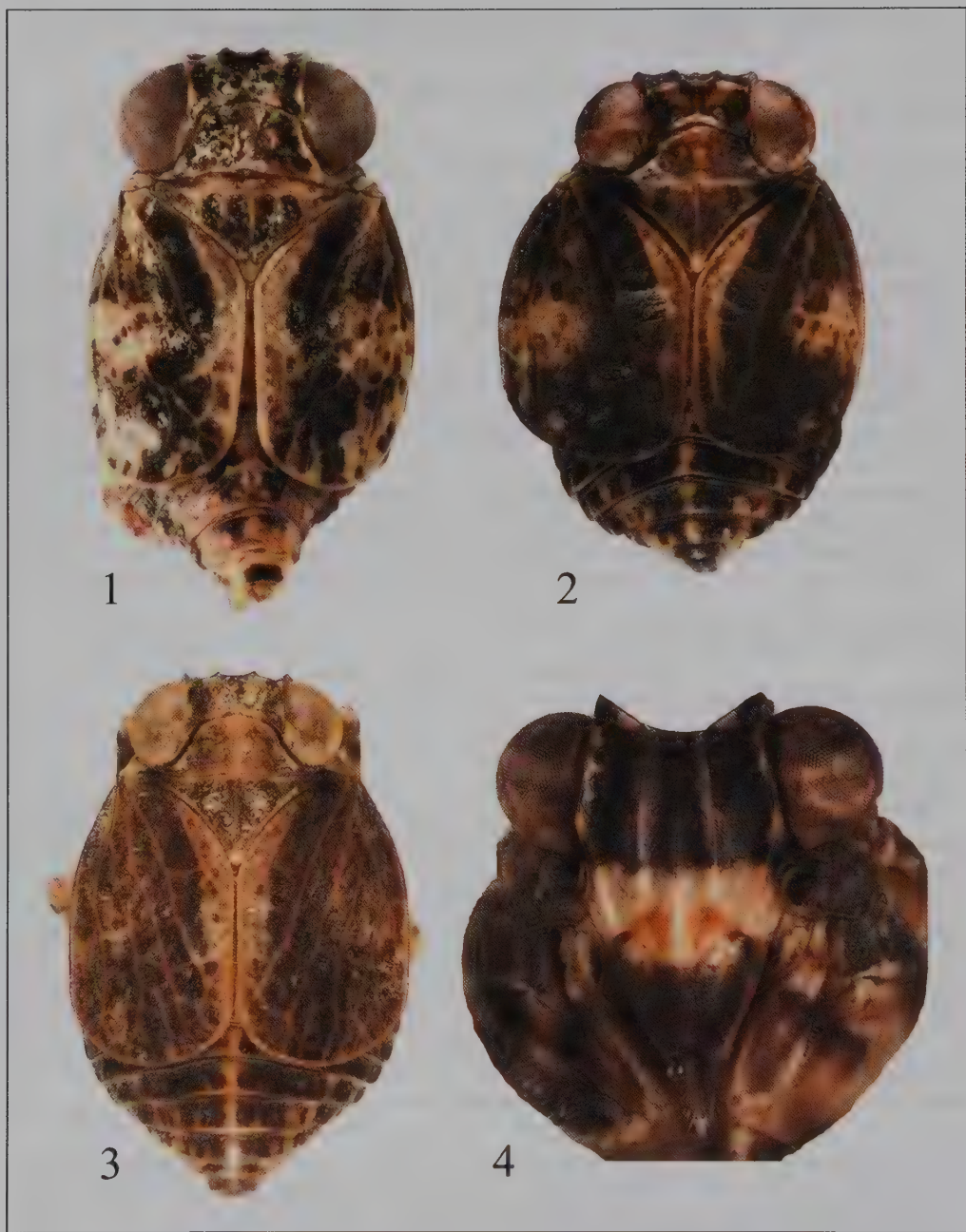
Tribe **Adenissini** Dlabola, 1980

Genus *Adenissus* Linnavuori, 1973

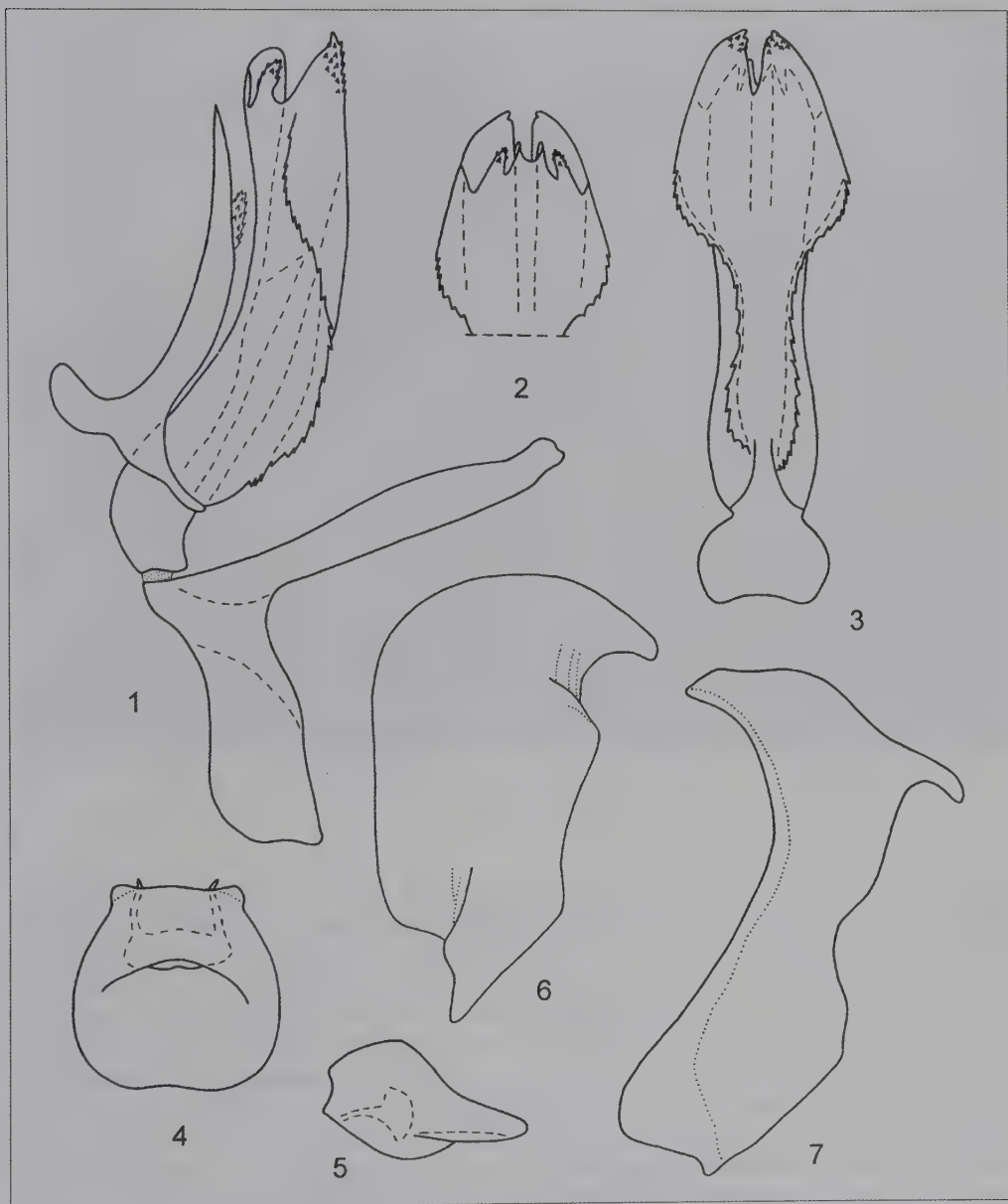
Adenissus riadicus Dlabola, 1985

Plates 1–4, Figures 1–15

Specimens examined: Jebel Jibir, 2♂, 5 larvae, 1272 m, 26.ix–9.x.2010, water traps, leg. A. van Harten. Sharjah Desert Park, sand dunes, 2♂, 5♀, 3 larvae, 10–25.iv.2010, leg. V.M. Gnezdilov & M.R. Wilson. Supplementary description: The body wide (Plates 1–3), dorso-ventrally flattened (in dorsal view). Metope wide, with lateral margins obtusely angulate, upper margin concave (Plate 4). Metope with median carina weak under its upper margin, distinct in its median and lower parts and running throughout post- and anteclypeus. Sublateral carinae of metope not fused with median carina, reach upper margin of metope. Median and sublateral carinae of metope are subparallel. Pedicel cylindrical. Coryphe transverse, lateral margins keel-shaped. Rostrum reaching hind coxae. Pronotum with median carina, anterior margin convex, posterior margin nearly straight. Mesonotum with weak median and lateral carinae. Brachypterous. Fore wings reach hind margin of tergites V–VI, with wide hypocostal plate and intermediate veins between longitudinal ones. Radius and mediana with long common stem. Radius bifurcate, mediana bi- or trifurcate, cubitus anterior rudimentary, cubitus posterior (claval suture) distinct only proximally, postcubitus and first anal vein fused or not fused apically. Hind wings rudimentary. Hind tibia with single lateral spine. First metatarsomere longer than second one, with 6–7 intermediate spines apically. Pretarsus with long rigid setae ventrally. Colouration variable (Plates 1–3). Metope dark brown or black, with yellow spots and dots, excluding ivory lower part above clypeus (Plate 4). Postclypeus from brown to black excluding ivory basal part, median carina pale. Anteclypeus dark brown or black, with pale median carina. Scapus and pedicel from brown to black. Coryphe and pronotum from light

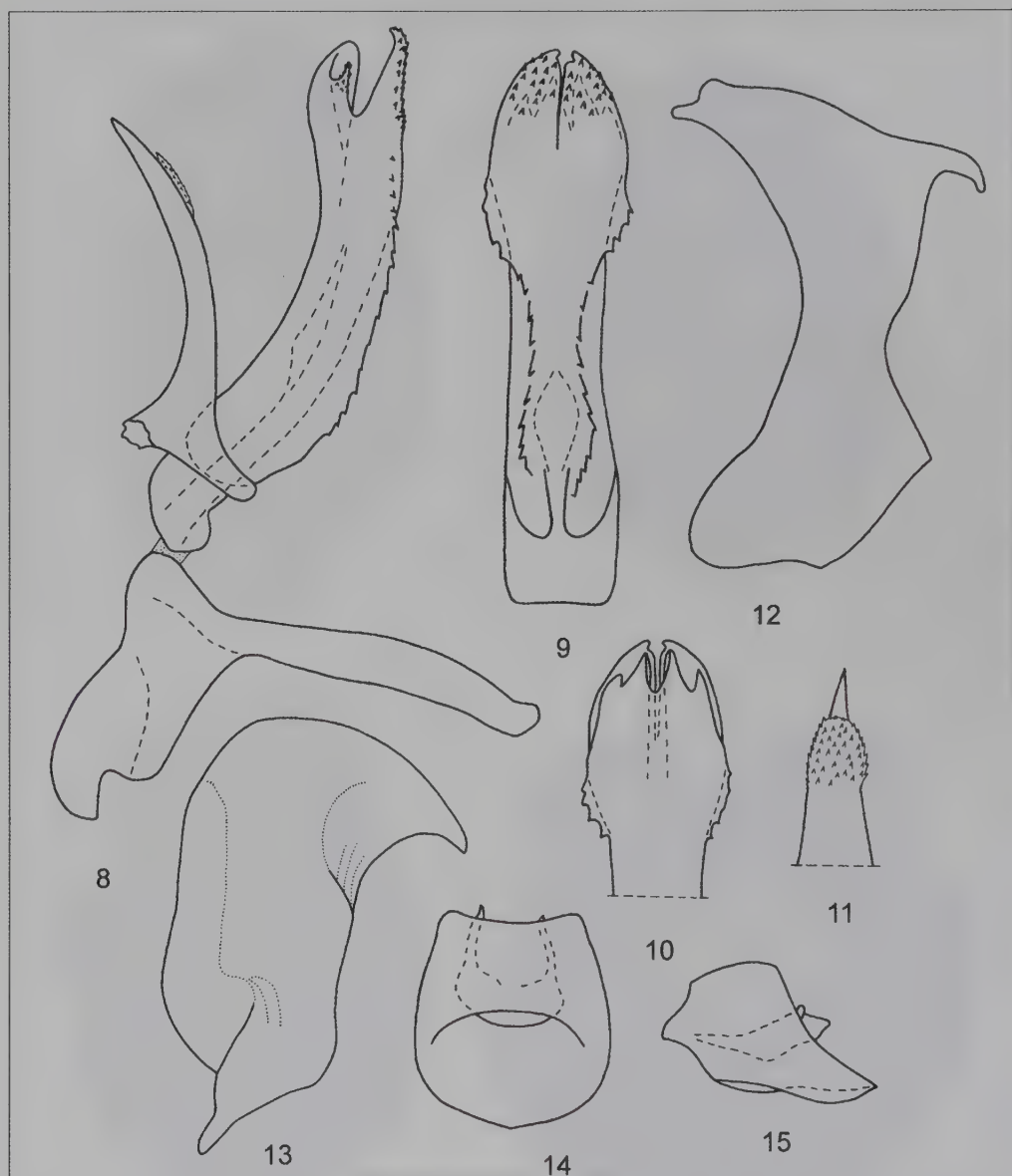


Plates 1-4. *Adenissus riadicus* Dlabola, habitus. 1: Specimen from Jebel Jibir, male, dorsal view; 2-4: Specimens from Sharjah Desert Park. 2: Male, dorsal view; 3: Female, dorsal view; 4: Male, frontal view.



Figures 1–7. *Adenissus riadicus* Dlabola, Oman, Dibab. Male genitalia. 1: Penis and connective, lateral view; 2: Apex of penis, dorsal view; 3: Penis, ventral view; 4: Anal tube, dorsal view; 5: Anal tube, lateral view; 6: Style, lateral view; 7: Pygofer, lateral view.

brown to dark brown, with dense yellow dots. Paranotal lobes, middle episternae and epimerae, and hind episternae light yellow, with dark brown or black patches. Mesonotum from light brown to black, with pale carinae and dots. Sometimes pro- and mesonotum totally



Figures 8–15. *Adenissus riadicus* Diabola, UAE, Sharjah Desert Park. Male genitalia. 8: Penis and connective, lateral view; 9: Penis, ventral view; 10: Apex of penis, dorsal view; 11: Apex of suspensorium process, ventral view; 12: Pygofer, lateral view; 13: Style, lateral view; 14: Anal tube, dorsal view; 15: Anal tube, lateral view.

light yellow, with rare brown dots. Fore wings dark brown or black, with pale veins and claval margins, often with pale patches (Plates 1–3). Legs light yellow, with dark brown patches. Spines of legs black. Abdominal tergites from light yellow, with dark brown spots, to



Plate 5. *Calligonum crinitum arabicum* in the Sharjah Desert Park. (Photograph © V. Gnezdilov)

black, with light green yellowish spots. Abdominal sternites from light green yellowish to light brown. Male anal tube light yellow laterally, brown or black medially. Female gonopods light brown or brown. The structure of male genitalia varies in details between the specimens (Figs 1–15): Anal tube wide, convex, straight or weakly concave apically (Figs 4, 14). Hind margin of pygofer with hook-shaped subapical process (Figs 7, 12). Suspensorium (Gnezdilov & Wilson (2006) mistakenly treated it as the process of the phallobase) with large awl-shaped process above the phallobase, with pad of denticles subapically (Fig. 11). Style massive, capitulum without lateral tooth, hind margin convex, caudo-dorsal angle widely rounded (Figs 6, 13). Phallobase slightly curved (in lateral view) Figs 1, 8). Ventral phallobase lobe with two longitudinal rows of teeth, collar subapically, and slit apically (Figs 1–3, 8–10). The width of the collar varies between the specimens (Figs 3, 9). Dorso-apically phallobase with 4 short processes (Figs 2, 10).

Female genitalia: Anal tube wide, truncate apically.

Total length. Males 3.7 (3.2 mm after Dlabola, 1985)–4.2 mm. Females 4.2–5.4 mm.

Remarks: In the UAE, *A. riadicus* Dlabola was collected on the coast of Arabian Gulf (Medinat Zayed), on sand dunes in the Sharjah Desert Park on *Calligonum crinitum arabicum* (Polygoniaceae) (Plate 5) and in mountains (Jebel Jibir, 1272 m) where several specimens were collected in water traps. Despite being flightless, three specimens were collected at light in the UAE (Medinat Zayed) and Oman (Jebel Shams, 1910 m; Nismah near Sur). In the Sharjah Desert Park 10 specimens of *A. riadicus* were collected during 10 hours sweeping

C. crinitum arabicum by net. In Oman *A. riadicus* was collected on *Limonium axillare* (Plumbaginaceae) and *Calligonum comosum* (Gnezdilov et al., 2004; Gnezdilov & Wilson, 2006). Perhaps the species has two generations – larvae are known from April and September–November (Gnezdilov et al., 2004; present data). Apparently there is difference in time of appearance of larvae in different regions. In middle–late April in sand desert (Sharjah Desert Park) the first generation appears – within the collected material females and larvae are prevalent, a single teneral male was collected on 13th April and another mature male on 25th April. In Saudi Arabia, the male holotype was collected on 17th March. The second generation probably starts (in mountains, Jebel Jibir) in late September–early October.

Adenissus brachypterus Linnavuori, 1973

Figures 16–21

Specimens examined: Holotype: ♂, labelled “W. Aden Prot. Lahej-Dhala road, 13-14.vii.63, Linnavuori” (AMNH). Paratype: ♂, same data (NMWC).

Key to the species of the genus *Adenissus* in the Arabian Peninsula

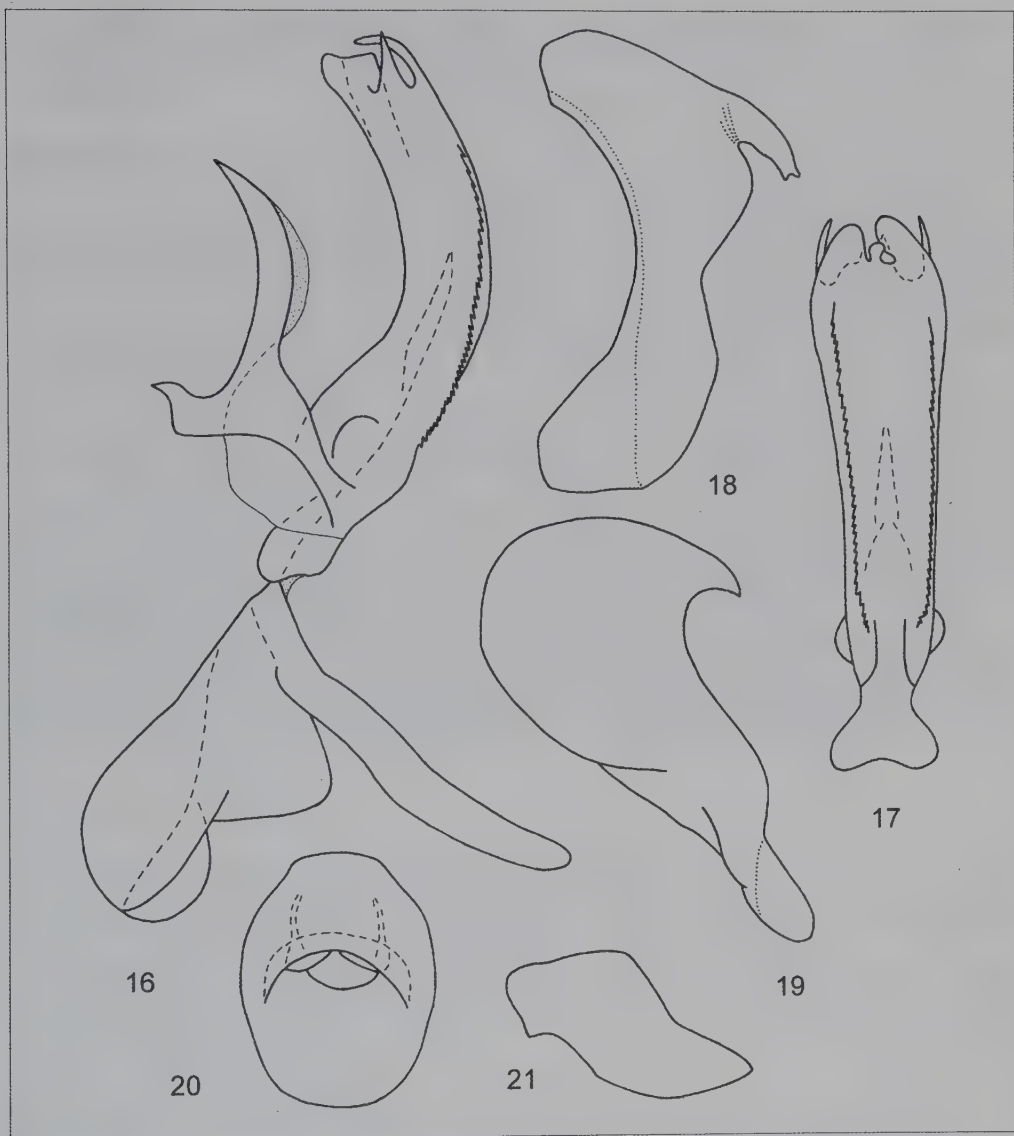
- 1 Fore wings reach hind margin of tergite IV. Ventral phallobase lobe without collar subapically (Fig. 17). The processes of hind margin of pygofer with truncate apices (Fig. 18). Male anal tube more narrow (in dorsal view) (Fig. 20) *Adenissus brachypterus* Linnavuori
- Fore wings reach hind margin of tergites V–VI. Ventral phallobase lobe with collar subapically (Figs 3, 9). The processes of hind margin of pygofer with rounded apices (Figs 7, 12). Male anal tube wider (in dorsal view) (Figs 4, 14) *Adenissus riadicus* Dlabola

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Figures 16–21. *Adenissus brachypterus* Linnavuori, holotype. Male genitalia. 16: Penis and connective, lateral view; 17: Penis, ventral view; 18: Pygofer, lateral view; 19: Style, lateral view; 20: Anal tube, dorsal view; 21: Anal tube, lateral view.

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Authors' addresses:

Dr. V.M. Gnezdilov, Zoological Institute of the Russian Academy of Sciences, Universitetskaya nab. 1, St. Petersburg 199034, Russia; e-mail: vmgnezdilov@mail.ru, vgnezdilov@zin.ru

Dr. M.R. Wilson, National Museum of Wales, Cathays Park, Cardiff CF10 3NP, UK; e-mail: Michael.Wilson@museumwales.ac.uk

Order Coleoptera, family Gyrinidae

Jiří Hájek

INTRODUCTION

The Gyrinidae represents a well-defined group within the hydradephagous families of Coleoptera. The adults are easily recognised based on their adaptation for life on the water surface. The family comprises worldwide nearly 900 species occurring in most running and stagnant freshwater habitats of all zoogeographic regions of the world, but prevailing in tropical areas. For detailed information about biology, morphology and classification of the family see Beutel & Roughley (2005).

Only little information about the occurrence of the family Gyrinidae in Arabian Peninsula is to be found in the literature. Two species, *Gyrinus luctuosus* Régimbart, 1883, and *Dineutus arabicus* Régimbart, 1907, were originally described from Saudi Arabia and Yemen respectively. Balfour-Browne (1951) published new records from Yemen. Further information about Arabian Gyrinidae is scattered in Brinck's (1955) "Revision of the Gyrinidae of the Ethiopian Region". Brancucci (1979, 1980, 1985) published new data from Saudi Arabia and Oman, and Rocchi (1985) supplemented information about Gyrinidae of Yemen.

No species of Gyrinidae was known from the territory of the United Arab Emirates until now. In the framework of the UAE Insect Project, Antonius van Harten, and the Czech entomologists Jan Batelka and Hynek Pinda collected two widespread species, which I present below.

MATERIALS AND METHODS

Both recorded species can be identified from photographs of their habitus, thus I have not included any additional diagnosis. The photographs of all specimens were taken with a Canon EOS 550D digital camera with Canon MP-E 65 mm objective. Images of the same specimen at different focal planes were combined using Helicon Focus 5.1.19 software.

The material is preserved in the collection of the National Museum in Prague, Czech Republic, the private collection of J. Batelka, Prague, Czech Republic, and the United Arab Emirates Invertebrate Collection.

SYSTEMATIC ACCOUNT

Subfamily **Gyrininae** Latreille, 1810

Tribe **Enhydrini** Régimbart, 1882

Dineutus (Protodineutus) aereus (Klug, 1834)

Specimens examined: Wadi Safad, 2♀, 17–24.vi.2006, light trap, leg. A. van Harten. Wadi Shawkah, 250–280 m, 4♂, 26.iii.2007, leg. J. Batelka & H. Pinda.

Distribution: A widespread African species occurring from Eastern Cape northwards to Saharan oases. It is recorded from Cape Verde and Socotra and seems to be widely distributed also in Arabia (Brinck, 1955). New to the UAE.



Plates 1–2. 1: *Dineutus aereus* (Klug) (13 mm); 2: *Gyrinus distinctus* Aubé (6.1 mm).

Tribe Gyrinini Latreille, 1810

Gyrinus (Gyrinus) distinctus Aubé, 1838

Specimens examined: SSW of ad-Dhaid, 1♀, 24–30.v. 2006, light trap, leg. A. van Harten. Hatta, 1♀, 24–30.v.2006, light trap, leg. A. van Harten.

Distribution: Widely distributed Palaearctic species. It occurs in Azores, northern Africa, most of the territory of Europe, except for the northernmost parts, and Asia eastwards to Mongolia and north-western China (cf. Mazzoldi, 2003). New to the UAE.

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Author's address:

J. Hájek, Department of Entomology, National Museum, Kunratice 1, CZ-148 00 Praha 4, Czech Republic; e-mail: jiri_hajek@nm.cz

Order Coleoptera, family Dytiscidae

Jiří Hájek and Michel Brancucci

INTRODUCTION

The Dytiscidae are the most speciose family of water beetles within the suborder Adephaga. More than 4000 species (Nilsson, 2001) occur in most running and stagnant freshwater habitats in all zoogeographic regions of the world. More details of the morphology, biology and taxonomy of diving beetles can, for example, be found in Balke (2005).

There is a long history of research on the water beetles of the Arabian Peninsula. The first species were described by Klug (1834), further species were described by Walker (1871), and two new species from Arabia were included in Sharp's (1882) monograph. Régimbart (1897) described two new species and recorded two others from Oman, while Gahan (1895) presented new records from Yemen. In the twentieth century, Balfour-Browne (1951) identified water beetle families from the British expeditions to south-west Arabia and Guignot (1951) described a new species from Yemen. However, systematic research on the fauna of the Arabian Peninsula started with the foundation of the project 'Fauna of Saudi Arabia' (recently renamed 'Fauna of Arabia'). The adephagous water beetle families were revised by Brancucci (1979, 1980, 1981, 1985). During the same period, Rocchi (1985) added new data for Yemen Arab Republic and a single dytiscid species was recorded from Qatar by Abdu & Shaumar (1985). Most recently, Wewalka (1992) described a new species from Yemen, Wewalka & Biström (1998) and Pederzani (2003) described new taxa from Oman, Wewalka (2004) summarised the Dytiscidae from Socotra Island, and Hájek & Wewalka (2009) studied Arabian species of the genus *Hydroglyphus* Motschulsky, 1853.

The dytiscid fauna of the territory of the United Arab Emirates (UAE) is an almost completely unknown component of the fauna of the Arabian Peninsula. Van Harten (2005) listed a single species of Dytiscidae – the cosmopolitan species *Eretes sticticus* (Linnaeus, 1767) from the UAE. Nevertheless, the extensive entomological research of Antonius van Harten in the years 2004–2007, together with several expeditions of other entomologists revealed the presence of 18 species of Dytiscidae, including two species new to science, and enables us to fill this gap in the knowledge of the fauna of the UAE.

MATERIALS AND METHODS

Most of the material included in this work came from the extensive entomological research of A. van Harten and his co-workers. This material is stored in tubes in ethanol and it is divided between the Naturhistorisches Museum in Basel, Switzerland (NHMB) and Národní Muzeum in Prague, Czech Republic (NMPC). Voucher specimens will also be deposited in the UAE Invertebrate Collection (UAEIC). The material collected by the Czech entomologists J. Batelka and H. Pinda is deposited in NMPC and in the private collection of J. Batelka, Prague, Czech Republic (JBCP), material collected by M.A. Jäch and K. Mahmood is deposited in the Naturhistorisches Museum Wien, Austria (NHMW), and that collected by I. Ribera et al. in the Museo Nacional de Ciencias Naturales, Madrid, Spain (CSIC). Some specimens from the collection of the Natural History Museum, London, Great Britain (BMNH) were studied as well, as was a specimen from the Staatliches Museum für Naturkunde, Stuttgart, Germany (SMNS).

The species are arranged alphabetically in the systematic account. The nomenclature follows Nilsson (2001); the classification of the tribe Hydatichini follows the most recent generic revision published by Miller et al. (2009), with the exception that *Prodaticus* Sharp, 1882, is treated as a subgenus of *Hydaticus* Leach, 1817 – which, in our opinion, supports the stability of the nomenclature. As all the recorded species can be identified from photographs of their habitus, we have not included an additional diagnosis for previously described taxa.

The photographs of all specimens were taken with a Canon EOS 550D digital camera with Canon MP-E 65 mm objective. Images of the same specimen at different focal planes were combined using Helicon Focus 5.1.19 software. The exact label data of the type material of the newly described species are cited. A forward slash (/) separates individual lines and a double slash (//) individual data labels. Authors' remarks are included in square brackets. Abbreviations used in the text are: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap; WT = water trap; AvH = leg. A. van Harten.

SYSTEMATIC ACCOUNT

Subfamily Copelatinae Branden, 1885

Tribe Copelatini Branden, 1885

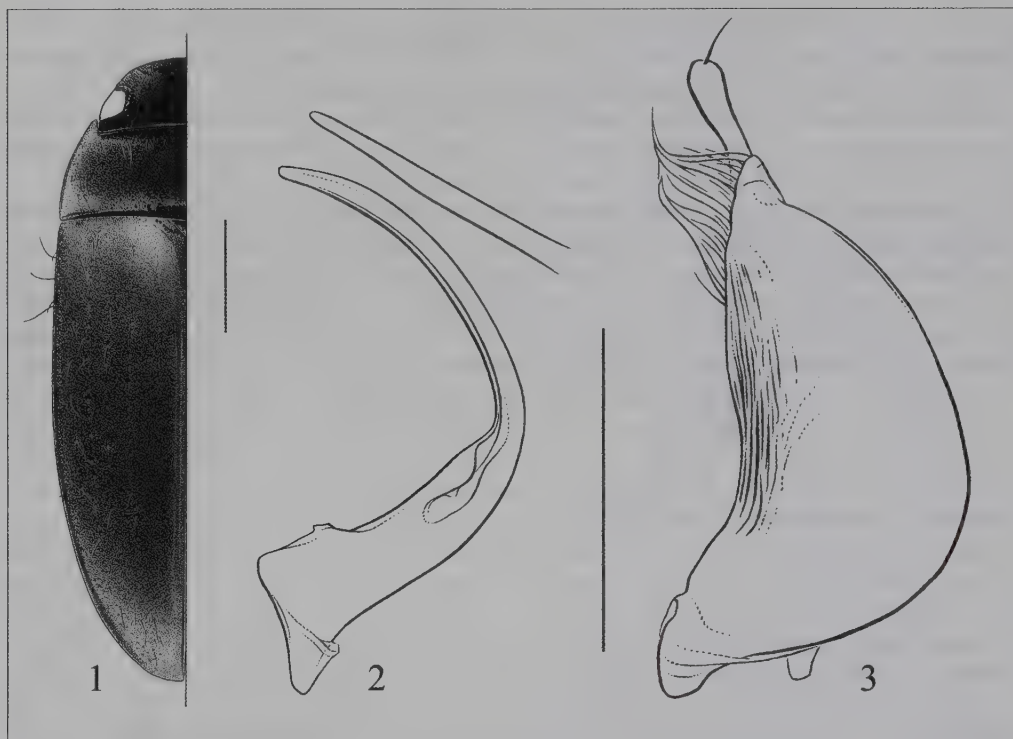
Copelatus antoniorum Hájek & Brancucci **nov. spec.**

Plates 1–2, Figures 1–3

Specimens examined: Holotype ♂ (NMPC), labelled: “OMAN: Batinah Prov. / WADI BANI AWF / oasis and stream with pools / 23°16'32''N, 57°27'36''E, 543 m / Antonín Reiter leg., 18.x.2009 [printed] // HOLOTYPE / COPELATUS / antoniorum sp. nov. / J. Hájek & M. Brancucci det. 2010 [red label, printed]”. Paratypes: 1♂ 9♀♀, same label data as holotype (BMNH, NHMB, NMPC); 1♂ 1♀, “6 Oman 6.4.2010 J. Al-Akhdar / wadi Bani Awf residual pools / N23 13 42.9 E57 25 25.8 660m / Ribera, Cieslak & Hernando leg. [printed]” (CISC); 1♂, “Oman: Wadi Abyadh / 232504N, 574022E / 21.XII.1994, 230m / 8650 / lg.MD Gallagher & B Skule [printed] // Aglymbus / gestroi Sharp [handwritten] / det.M.Brancucci [printed] 95 [handwritten]” (Staatliches Museum für Naturkunde, Stuttgart, Germany). 1♂ 1♀, “U.A.E. / Bitnah (light trap) / 31.xii.2005-02.ii.2006 / A. van Harten leg. ([loc. no.] 6085) [printed]” (NMPC); 1♀, “U.A.E. 2-26.i.2006 / Wadi Safad (water trap) / 25.13N 56.19E / A. van Harten leg. ([loc. no.] 4747) [printed]” (NMPC); 1♀, “U.A.E. 4-26.iii.2006 / Wadi Safad (light trap) / 25.13N 56.19E / A. van Harten leg. ([loc. no.] 10926) [printed]” (NHMB); 1♂, “U.A.E. 21-28.iii.2006 / near Mahafiz (light trap) / 25.09N 55.48E / A. van Harten leg. ([loc. no.] 8660) [printed]” (NMPC); 3♂♂ 4♀♀, “U.A.E. 27.iv-4.v.2006 / Wadi Madaq (light trap) / 25.18N 56.07E / A. van Harten leg. ([loc. no.] 4801) [printed]” (NHMB, NMPC); 2♀♀, “U.A.E. 2-16.ii.2006 / Wadi Madaq (light trap) / 25.18N 56.07E / A. van Harten leg. ([loc. no.] 4996) [printed]” (NHMB, NMPC); 1♂, “U.A.E. 20-27.v.2006 / Fujairah (light trap) / 25.08N 56.21E / A. van Harten leg. ([loc. no.] 4841) [printed]” (NMPC); 1♀, “U.A.E. 31.v-7.vi.2006 / Sharjah x Khor Kalba / (light trap) / van Harten leg. ([loc. no.] 7104) [printed]” (NMPC); 1♂ 2♀♀, “U.A.E. 16.-30.viii.2006 / Hatta (light trap) / 24.49N 56.07E / A. van Harten leg. ([loc. no.] 10958) [printed]” (NHMB, NMPC); 1♀, “U.A.E. 17-24.iii.2007 / Sharjah Desert Park / 25.17N 55.42E (light trap) / A. van Harten leg. ([loc. no.] 7069) [printed]” (NMPC); 2♂♂ 3♀♀, “U.A.E. 1.-8.iv.2009 / Wadi Wurayah farm / (light trap) / A. van Harten leg. ([loc. no.] 10990) [printed]” (NHMB, NMPC). Each paratype is provided with a red label similar to that of the holotype, except for the word “PARATYPE” instead of the word “HOLOTYPE”, and the respective sex symbol.

Description: Elongate oval; Head semicircular, clypeus nearly straight. Pronotum widest at base, convex. Sides of pronotum regularly rounded. Elytra nearly subparallel, except for apex (Fig. 1).

Measurements: Body length 4.9–5.8 mm (holotype 5.4 mm), width 2.0–2.5 mm (holotype 2.3 mm).



Figures 1–3 *Copelatus antoniorum* nov. spec. 1: Habitus; 2: Median lobe in lateral view; 3: Paramere. Scale bars: 1 mm (Fig. 1); 0.5 mm (Figs 2–3).

Colouration. Body colouring ferrugineous, appendages, sides of pronotum and indistinct transverse basal band on elytra lighter.

Surface sculpture. Head. Microsculpture consisting of a fine and superficial microreticulation with small and uniform polygonal meshes as well as a fine punctation: punctures fine, particularly on clypeus and on frons, becoming coarser and denser on vertex. Rows of coarse punctures along eye margins and in small depressions antero-laterally to eyes. Antenna with antennomeres long and slender, the 5th almost 3 times longer than broad.

Pronotum. Transverse; lateral margins gently bent and very finely bordered. Microsculpture consisting of fine and slightly impressed meshes, similar to that of head. Punctation consists of sparsely distributed very small punctures, and coarse setigerous punctures along anterior margin, on latero-basal quarter and posteriorly in front of corner strongly impressed; punctures dense and coalescent.

Elytra uniformly reticulated, reticulation consisting of small polygonal meshes. Punctation consists of coarse, and very small and very fine punctures, hardly visible. Coarse punctures form an indistinct row along suture, three distinct longitudinal rows on disc, and one lateral row; rows of punctures well marked on apical part, getting sparser and smaller towards base. Additional coarse punctures are present between third discal and lateral row, and along lateral margin. Distance between suture and first discal row is twice as broad as distance between other discal rows of punctures.

Ventral part. Finely microreticulated, intermixed with very small sparsely distributed punctures. Meshes polygonal (isodiametric), except for metacoxae and abdominal ventrite I (longitudinal), abdominal ventrite II (diagonal), and abdominal ventrites III–IV (transverse). Prosternum obtusely keeled medially. Prosternal process obtusely lanceolate, bordered. Metepisterna ('metasternal wings') tongue-shaped, slender. Line delimiting metacoxae present, but incomplete. Metacoxae and abdominal ventrites I–II with numerous striae, possibly for stridulation. Indistinct transverse rows of large setigerous punctures are present on abdominal sternites.

Male. Pro- and mesotarsomeres 1–3 distinctly broadened, with adhesive discs on their ventral side. Median lobe of aedeagus as depicted in Figure 2. Lateral lobe (paramere) broad, nearly semicircular, apically with long setae along inner margin (Fig. 3).

Female. Punctuation on head slightly coarser than in male. Sides of pronotum with short striolation. Elytra with rows of coarse punctures as in male; but unlike male, discal rows of punctures connected by weak, sometimes interrupted striae. Additional weak longitudinal stria presents in apical half of interspace between suture and first discal row of punctures. Short irregular striae present in interspaces between second stria (first discal row of punctures) and lateral margin of elytra. Pro- and mesotarsomeres 1–3 not broadened.

Differential diagnosis: The habitus of the new species is very similar to that of *C. gestroi* (Sharp, 1882) described from Ethiopia and recorded also from Egypt, Sinai, Israel, Saudi Arabia and Oman (Nilsson, 2009). However, it is slightly smaller and almost uniformly ferrugineous coloured; the basal testaceous band is not so distinctly delimited as in *C. gestroi*. The microsculpture of *Copelatus antoniorum* nov. spec. is also more superficial and less coarse than in *C. gestroi*. Finally, the new species differs also in the shape of the male median lobe (cf. Wewalka, 1974: Fig. 7), which is long, strongly curved and very slender. The female of *C. antoniorum* nov. spec. differs from *C. gestroi* in having four distinguishable longitudinal "true" striae on the disc of the elytra, and striolate interspaces between the second stria and the lateral margin of the elytra.

Notes on generic classification: *C. gestroi* was originally described in the genus *Aglymbus* Sharp, 1882, based on the partly reduced metacoxal lines. This genus was recently studied by Shaverdo et al. (2008) using morphological and molecular methods. They limited *Aglymbus* to a strictly Neotropical genus, placed the Madagascan species previously associated with *Aglymbus* in the new genus *Madaglymbus* Shaverdo & Balke, 2007, and transferred the Ethiopian species to the genus *Copelatus* Erichson, 1832. Following this work, we also placed our species in *Copelatus*.

Habitats and methods of collection: The specimens from the type locality were collected in small pools formed by a stream in a wadi (Plates 20–21). The specimens from the United Arab Emirates were mostly collected at light.

Distribution: The species is so far only known from several localities in northern Oman and the UAE.

Etymology: The new species is dedicated to its collectors: Antonius van Harten (Sharjah, United Arab Emirates) and Antonín Reiter (Čížov, Czech Republic).

Subfamily **Dytiscinae** Leach, 1815

Tribe **Cybistrini** Sharp, 1882

Cybister (Cybister) tripunctatus lateralis (Fabricius, 1798)

Plate 3

Specimens examined: Sharjah-Khor Kalba, near tunnel, 1♀, 24.iii.2010, leg. K. Mahmood.

Distribution: A species widely distributed in tropical and subtropical areas of the Old World. Four subspecies are currently recognised (Nilsson, 2001), occurrence of two of them is possible in the UAE: *C. tripunctatus africanus* Laporte de Castelnau, 1835, is distributed in continental Africa, southern Europe and it was recorded also from the Arabian Peninsula (Nilsson, 2009); *C. tripunctatus lateralis* occurs in continental Asia from Turkey to Japan, China and Indochina. However differences between subspecies are not well delimited, and assignment of single female is problematic. *Cybister t. africanus* is usually characterised by less oval body shape and black venter (Guignot, 1961: 914), but our specimen is rather elongated with fulvous venter; we therefore assign it tentatively to subspecies *C. t. lateralis*. New to the UAE.

***Cybister (Melanectes) vulneratus* Klug, 1834**

Plate 4

Specimens examined: Wadi Wurayah, pool, stream, 1 ex., 4.xii.2006, leg. J.-L. Gattolliat; 210 m, 1 ex., 5.x.2007, leg. J. Batelka & H. Pinda; 222 m, stream, 3 ex., 24.i.2010, leg. M.A. Jäch.

Distribution: This is a widely distributed African species. In the Palaearctic Region, it occurs in northern Africa, Spain and Italy in Europe, and the Arabian Peninsula (Nilsson, 2009). New to the UAE.

Tribe Eretini Crotch, 1873

***Eretes sticticus* (Linnaeus, 1767)**

Plate 5

Specimens examined: Al-Ajban, 1 ex., 5–12.vi.2006, LT, AvH. SSW of ad-Dhaid, 1 ex., 29.xii.2005–7.i.2006, LT, AvH. Fujairah, 1 ex., 13.xi–10.xii.2005, LT, AvH; 1 ex., 28.ii–1.iv.2006, LT, AvH. Medinat Zayed, 2 ex., end vii.2005, LT, leg. B.J. Tigar (BMNH). Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH. Wadi Asimah, Al Ghail env., 314 m, 1 ex., 28.ix.2007, leg. J. Batelka & H. Pinda. Wadi Bih dam, 1 ex., 24.iv–1.v.2007, LT, AvH; 2 ex., 29.vi–8.vii.2008, LT, AvH. Wadi Hayl, 225 m, 1 ex., leg. J. Batelka & H. Pinda. Wadi Shawkah, 250–280 m, 2 ex., 3.x.2007, leg. J. Batelka & H. Pinda; 1 ex., 25.x–15.xi.2007, WT, AvH.

Published records: Walker & Pittaway (1987): UAE; Tigar & Osborne (1999): Abu Dhabi Emirate.

Distribution: A cosmopolitan species occurring in the Old World from the Middle East throughout Africa north to Cyprus, including the Cape Verde and Canary Islands (Miller, 2002).

Tribe Hydaticini Sharp, 1882

***Hydaticus (Prodatiscus) histrio* Clark, 1864**

Plate 6

Specimens examined: Fujairah, 2 ex., 20–27.v.2006, LT, AvH. Hatta, 1 ex., 4–11.iv.2006, LT, AvH; 1 ex., 8–26.iv.2006, LT, AvH. Sharjah Desert Park, 1 ex., 22.ii–9.iii.2005, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH. Wadi Hayl, 234–240 m, stream, 3 exs, 26.i.2010, leg. M.A. Jäch. Wadi Maidaq, 1 ex., 2–16.ii.2006, LT, AvH. Wadi Safad, 2 ex., 2–26.i.2006, WT, AvH; 1 ex., 21.ii–4.iii.2006, LT, AvH.

Distribution: A species occurring from Iraq and the Arabian Peninsula to Iran, Kazakhstan, Afghanistan and Pakistan, and extending also to India in the Oriental Region (Nilsson, 2009). New to the UAE.

***Hydaticus (Prodatiscus) pictus* (Sharp, 1882)**

Plate 7

Specimens examined: Fujairah, 3 ex., 20–27.v.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 24–30.v.2006, LT, AvH. Wadi Bih dam, 1 ex., 19.ii–29.iii.2007, LT, AvH. Wadi Maidaq, 1 ex., 2–16.ii.2006, LT, AvH. Wadi Safad, 4 ex., 2–26.i.2006, WT; 3 ex., 21.ii–4.iii.2006, LT; 1 ex., 14–21.v.2006, LT; all AvH.



Plates 1–4. 1–2: *Copelatus antoniorum* nov. spec. 1: Male (5.7 mm); 2: Female (5.8 mm); 3: *Cybister* (*Cybister*) *tripunctatus lateralis* (Fabricius) (28 mm); 4: *Cybister* (*Melanectes*) *vulneratus* Klug (26 mm).

Distribution: This species is widespread in the Middle East and is known from Syria, Iraq, the Arabian Peninsula, Iran, Pakistan and Russian Central Asia (Nilsson, 2009). New to the UAE.

***Hydaticus (Prodaticus) servillianus* Aubé, 1838**

Plate 8

Specimens examined: Al-Ajban, 1 ex., 26.ii–27.iii.2006, LT; 3 ex., 6–22.v.2006, LT; 1 ex., 5–12.vi.2006, LT; all AvH. Ra's al-Khaimah, Khuzam, 2 m, ground water pool, 6 ex., 25.i.2010, leg. M.A. Jäch & K. Mahmood. Wadi Safad, 1 ex., 20.xii.2005–2.i.2006, LT; 5 ex., 2–26.i.2006, WT; 2 ex., 21.ii–4.iii.2006, LT; 10 ex., 15–22.iv.2006, LT; 6 ex., 14–21.v.2006, LT; all AvH.

Distribution: This species is widely distributed in the whole Afrotropical Region, mainly in central Africa and Madagascar (Guignot, 1961). In the Palaearctic Region, it extends to Yemen and Oman (Nilsson, 2009). New to the UAE.

Subfamily **Hydroporinae** Aubé, 1836

Tribe **Bidessini** Sharp, 1882

***Glareadessus stocki* Wewalka & Biström, 1998**

Plate 9

Specimens examined: Al-Ajban, 1 ex., 10–17.x.2005, LT & MT, AvH. Bithnah, 3 ex., 31.xii.2005–2.ii.2006, LT, AvH. Fujairah, 2 ex., 13.xi–10.xii.2005, LT; 1 ex., 28.ii–1.iv.2006, LT; 1 ex., 15–22.iv.2006, LT; 5 ex., 20–27.v.2006, LT; all AvH. Hatta, 3 ex., 8–26.iv.2006, LT, AvH; 4 ex., 16–30.viii.2006, LT, AvH; 3 ex., 30.xi.2006, J.-L. Gattolliat. Sharjah Desert Park, 3 ex., 18.i–25.ii.2006, LT; 1 ex., 17–24.iii.2007, LT; 2 ex., 24.iii–1.iv.2007, LT; all AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 3–18.v.2006, LT; 18 ex., 24–30.v.2006, LT; 1 ex., 31.v–7.vi.2006, LT; 3 ex., 7–14.vi.2006, LT; all AvH. Wadi Madaq, 17 ex., 2–16.ii.2006, LT; 66 ex., 27.iv–4.v.2006, LT; 1 ex., 17–24.v.2006, LT; 7 ex., 1–8.vii.2006, LT; all AvH. Wadi Safad, 2 ex., 20.xii.2005–2.i.2006, LT; 1 ex., 2–26.i.2006, WT; 2 ex., 21.ii–4.iii.2006, LT; 28 ex., 15–22.iv.2006, LT; 9 ex., 14–21.v.2006, LT; 5 ex., 17–24.vi.2006, LT; all AvH. Wadi Safad, in stream, 2 ex., 28.xi.2006, leg. J.-L. Gattolliat. Wadi Wurayah, in pool and stream, 1 ex., 4.xii.2006, leg. J.-L. Gattolliat. Wadi Wurayah farm, 1 ex., 15–30.iii.2009, LT; 7 ex., 1–8.iv.2009, LT; 1 ex., 12–19.iv.2009, LT; all AvH.

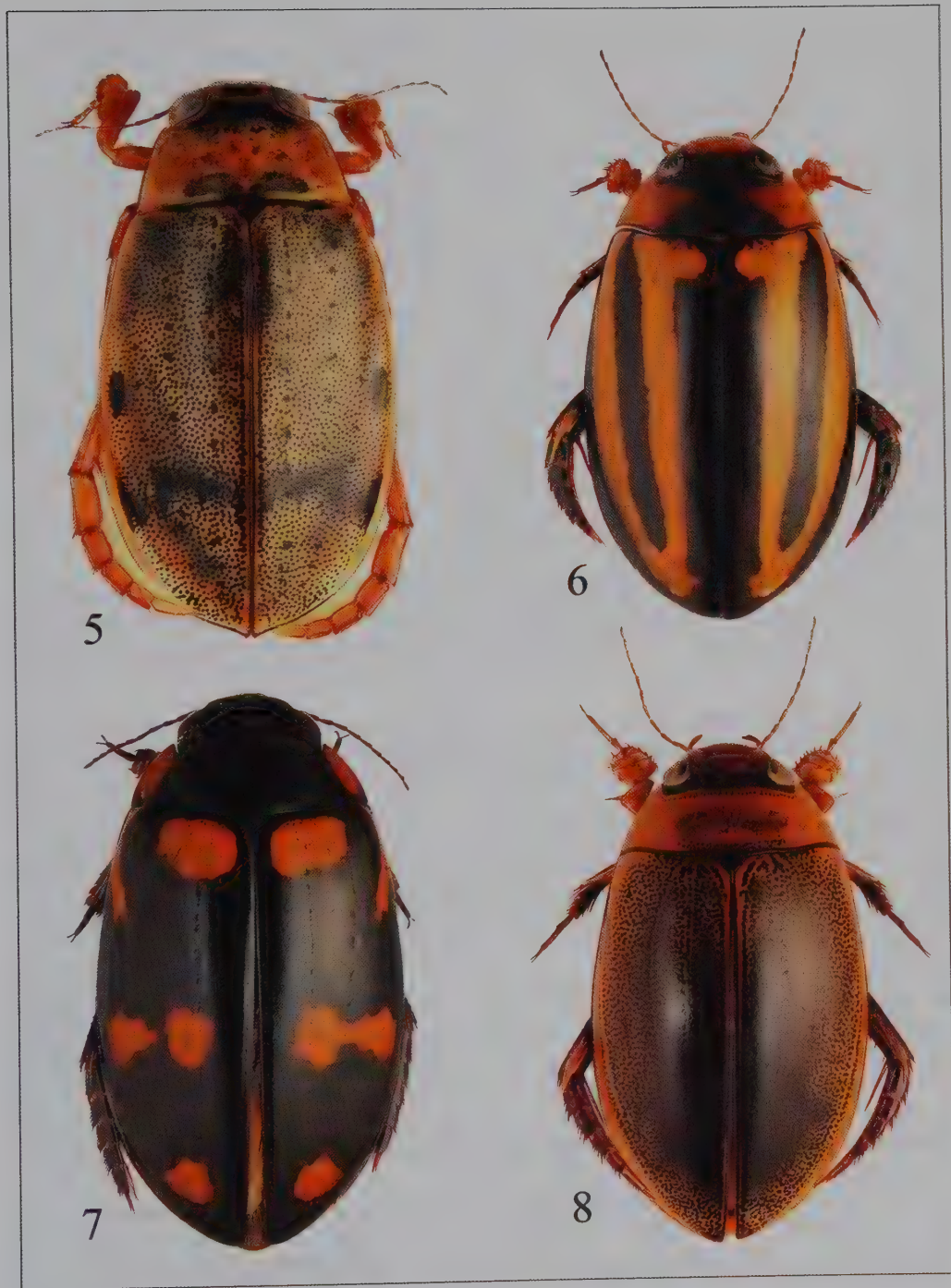
Distribution: This species was described, and so far is only known, from Oman (Wewalka & Biström, 1998). New to the UAE.

***Hydroglyphus angularis* (Klug, 1834)**

Plate 10

Specimens examined: Bithnah, 20 ex., 31.xii.2005–2.ii.2006, LT; 11 ex., 4–23.iii.2006, LT; 1 ex., 17–24.vi.2006, LT; all AvH. SSW of ad-Dhaid, 54 ex., 10–29.xii.2005, LT; 1 ex., 29.xii.2005–7.i.2006, LT; all AvH. Fujairah, 3 ex., 13.xi–10.xii.2005, LT; 12 ex., 28.ii–1.iv.2006, 7 ex., LT; 20–27.v.2006, LT; all AvH. Hatta, 1 ex., 17–28.iii.2006, LT, AvH; 1 ex., 8–26.iv.2006, LT, AvH; 1 ex., 17–24.viii.2006, LT, AvH; 3 ex., 30.xi.2006, leg. J.-L. Gattolliat. E of Jebel Hafeet, shallow pools in desert, 318 m, 2 exs, 27.i.2010, leg. M.A. Jäch. Near Mahafiz, 2 ex., 4–11.iv.2006, LT, AvH. Sharjah Desert Park, 2 ex., 20.x–8.xi.2005, LT; 1 ex., 18.i–25.ii.2006, LT; 2 ex., 17.ii–3.iii.2007, LT; 1 ex., 10–17.iii.2007, LT; all AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 31.v–7.vi.2006, LT, AvH. Wadi Bih dam, 3 ex., 19.ii–29.iii.2007, LT, AvH. Wadi Madaq, 7 ex., 27.xi–22.xii.2005, LT; 1 ex., 22.xii.2005–2.ii.2006, LT; 2 ex., 2–16.ii.2006, LT; 1 ex., 27.iv–4.v.2006, LT; all AvH. Wadi Safad, 5 ex., 20.xii.2005–2.i.2006, LT; 2 ex., 31.i–21.ii.2006, LT; 8 ex., 15–22.iv.2006, LT; all AvH. Wadi Wurayah, 1 ex., 18–25.iii.2007, MT, AvH. Wadi Wurayah farm, 3 ex., 15–30.iii.2009, LT; 4 ex., 1–8.iv.2009, LT; 3 ex., 12–19.iv.2009, LT; all AvH.

Distribution: This species is widely distributed in the entire northern half of Africa (Biström, 1986). In Asia it is known from Turkey, Iraq, Arabian Peninsula, Iran and Pakistan (Nilsson, 2009). New to the UAE.



Plates 5–8. 5: *Eretes sticticus* (Linnaeus) (14 mm); 6: *Hydaticus* (*Prodaticus*) *histrio* Clark (13 mm); 7: *Hydaticus* (*Prodaticus*) *pictus* (Sharp) (15 mm); 8: *Hydaticus* (*Prodaticus*) *servillianus* Aubé (10.5 mm).

***Hydroglyphus hormuzensis* Hájek & Brancucci nov. spec.**

Plate 11, Figures 4–6

Specimens examined: Holotype ♂ (NMPC), labelled: “UAE RAS AL KHAIMAH / Wadi Fara, env. Al Ghail / N 25°25'06” E 55°05'50” / 266 m a. s. l., 17.III.2007 / J. Batelka & H. Pinda leg. [printed] // HOLOTYPE / HYDROGLYPHUS / hormuzensis sp. nov. / J. Hájek & M. Brancucci det. 2010 [red label, printed]”. Paratypes: 24♂♂ 26♀♀, same label data as holotype (BMNH, JBCP, NHMB, NMPC, UAEIC); 1♂ 4♀♀, “U.A.E. 2-16.ii.2006 / Wadi Madaq (light trap) / 25.18N 56.07E / A. van Harten leg. ([loc. no.] 4996) [printed]” (NHMB, NMPC); 1♂ 1♀, “U.A.E. 27.iv.-4.v.2006 / WADI MAIDAQ / 25.18N 56.07E (light trap) / A. van Harten leg. ([loc. no.] 4801) [printed]” (NMPC); 3♂♂ 4♀♀, “U.A.E. 6-13.v.2006 / Wadi Madaq (light trap) / 25.18N 56.07E / A. van Harten leg. ([loc. no.] 10359) [printed]” (NHMB, NMPC); 2♂♂ 2♀♀, “U.A.E. 17.-24.v.2006 / Wadi Madaq (light trap) / 25.18N 56.07E / A. van Harten leg. ([loc. no.] 10573) [printed]” (NHMB, NMPC); 10♂♂ 8♀♀ “U.A.E. 28.xi.2006 / WADI MAIDAQ / 25.18N 56.07E (pool) / J.-L. Gattoliat leg. ([loc. no.] 5753) [printed]” (NHMB, NMPC); 1♂, “U.A.E. 30.xi.2006 / WADI HATTA / J.-L. Gattoliat leg. ([loc. no.] 5773) [printed]” (NMPC); 1♂, “U.A.E. 20.x-24.xi.2007 / Sharjah Desert Park / 25.17N 55.42E (light trap) / A. van Harten leg. ([loc. no.] 8055) [printed]” (NMPC); 1♂ 1♀, “U.A.E. 1.-8.iv.2009 / Wadi Wurayah farm / (light trap) / A. van Harten leg. ([loc. no.] 10990) [printed]” (NHMB, NMPC). 5 exs, “UAE: Ras al-Khaimah / (south), Wadi Shawkah / Hajar Mountains (UAE 3) / ca. 80 km ESE Dubai / 23.I.[20]10, leg. M.A. Jäch // upper course / residual pools / ca. 318 m a.s.l. / 25°06'06.1"N / 56°03'26.4"E [printed]” (NHMW, NMPC). 1♂, “U.A.E. 22.ii.2010 / Wadi Shawkah / (stream) / K. Mahmood leg. ([loc. no.] 11590) [printed]” (NHMB). 1♂, “OMAN, Batinah Prov. / WADI SAHTAN ca 600 m a.s.l. / Umq vill. env., puddle / 23°20'14"N; 57°18'55"E (GPS) / 19.x.2009 A. REITER lgt. [printed]” (NMPC). 1♂ 1♀, “3 Oman 6.4.2010 J. Al-Akhdar / rd. Tanuf-Hat, residual pools in wadi / N23 05 36.2 E57 25 56.6 1307m / Ribera, Cieslak & Hernando leg. [printed]” (CSIC). 1♂ 4♀♀, “IRAN 16.-17.IV.2000 / Hormozgan Prov., 350 m / 10 km E DEHBAREZ / (27°27'N, 57°10'E) // Iran 2000 Czech Biological / Expedition / J. HÁJEK & M. MIKÁT leg.” (NMPC). Each paratype has a red label similar to that of the holotype, except the word “PARATYPE” is used instead of the word “HOLOTYPE”, and the respective sex symbol.

Description: Body oblong oval. Pronotum nearly rectangular. Sides of pronotum almost straight, anteriorly slightly curved inwards. Pronotum distinctly narrower than elytra; angle between pronotum and elytra fairly distinct. Pronotum, elytra and ventral surface covered with recumbent setae.

Measurements: Body length 2.0–2.2 mm (holotype 2.1), width 1.0–1.1 mm (holotype 1.0).

Colouration. Body colouring almost uniformly brownish-black; basal antennomeres, mouth appendages, anterior corners of pronotum, tibiae and tarsi usually indistinctly paler.

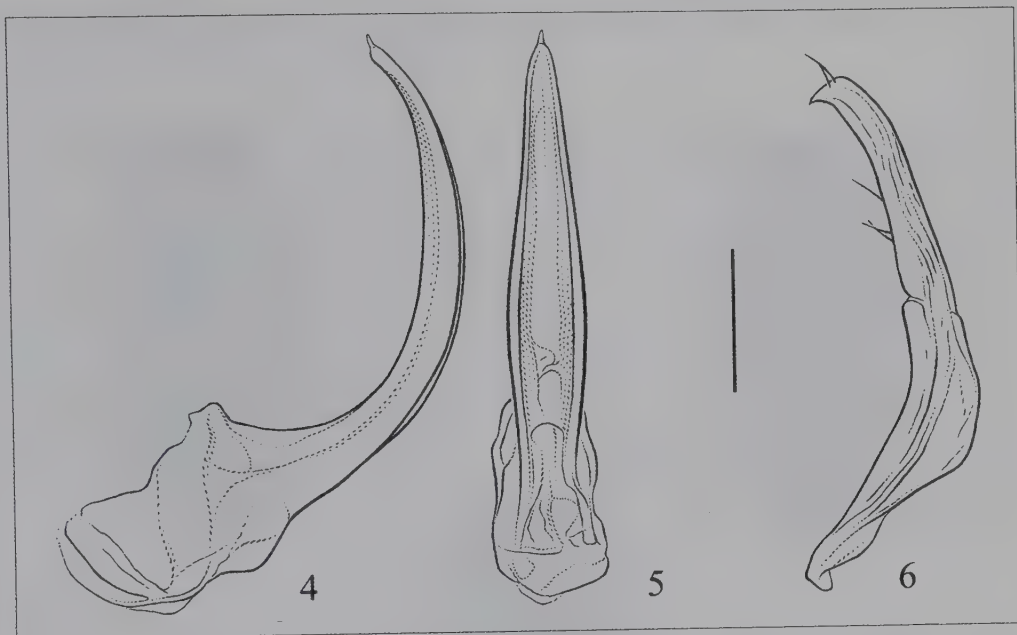
Surface sculpture. Head finely microsculptured; punctation fine, rather sparse, posteriorly lacking behind eyes; anterior margin of head rounded; frontolateral depressions shallow.

Pronotum submatt, finely microsculptured, with fine, almost regularly distributed setigerous punctures; striae fairly strongly impressed. Elytra submatt, finely microsculptured; punctation similar to that of pronotum; basal striae well developed, slightly shorter than striae on pronotum; sutural line distinct from close to base to apex. Epipleura finely punctate. Ventral surface finely microsculptured, microsculpture on metaventre and abdominal ventrites composed of distinctly transverse meshes; punctation composed of fine, sparse, irregularly distributed punctures. Metacoxal lines almost straight, anteriorly slightly divergent.

Male. Pro- and mesotarsi slightly broadened. Median lobe in ventral view slender, parallel; apex pointed (Fig. 4). Median lobe in lateral view nearly regularly inflexed; apex with short upward bent hair-like projection (Fig. 5). Parameres (lateral lobes) seemingly only two-segmented (Fig. 6).

Female. Similar to male in habitus. Pro- and mesotarsi narrow.

Differential diagnosis: The uniform dark body colouration of this new species is similar to



Figures 4–6 *Hydroglyphus hormuzensis* nov. spec. 4: Median lobe in lateral view; 5: Same in ventral view; 6: Lateral lobe (paramere). Scale bar: 0.1 mm.

that of *H. strigicollis* (Fairmaire, 1880) from Reunion. However, the new species differs from that taxon in its shorter body length, broader and flat habitus, and differences in the shape of the male genitalia (see Biström, 1986: Fig. 19). The male genitalia of *Hydroglyphus hormuzensis* nov. spec. are very similar to that of the widespread African *H. zanzibarensis* (Régimbart, 1906). It differs from that species in having well developed basal elytral striae, a more slender apex of the male median lobe in ventral view, the apex of the median lobe with a hair-like projection, and by the unmodified female apical abdominal ventrite.

Habitats and methods of collection: The new species was collected in small pools in wadis, and at light.

Etymology: The specific epithet refers to the area of the Strait of Hormuz, where the new species was collected.

Distribution: The species is so far only known from several localities on both the Arabian (Oman, UAE) and the Iranian side of the Strait of Hormuz.

Hydroglyphus sinuspersicus Hájek & Wewalka, 2009

Specimens examined: Hatta, 1 ex., 30.xi.2006, leg. J.-L. Gattoliat. E of Jebel Hafeet, shallow pools in desert, 318 m, 2 ex., 27.i.2010, leg. M.A. Jäch. Near Mahafiz, 1 ex., 4–11.iv.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 24–30.v.2006, LT, AvH. Wadi Bih dam, 1 ex., 24.iv–1.v.2007, LT, AvH. Wadi Fara, Al-Ghail env., 266 m, 21 ex., 17.iii.2007, leg. J. Batelka & H. Pinda. Wadi Madaq, 2 ex., 27.xi–22.xii.2005, LT, AvH; 1 ex., 27.iv–4.v.2006, LT, AvH; pool, 6 ex., 28.xi. 2006, leg. J.-L. Gattoliat. Wadi Shawkah, residual pools, 318 m, 1 ex.; 23.i.2010, leg. M.A. Jäch. Wadi Tarabat, springfed pools, 450 m, 24 ex., 27.i.2010, leg. M.A. Jäch.

Distribution: A species described recently from the area of the Persian Gulf. It was previously misidentified as *Hydroglyphus major* (Sharp, 1882) (cf. Sharp, 1882; Biström, 1986).



Plates 9–13. 9: *Glareadessus stocki* Wewalka & Biström (1.9 mm); 10: *Hydroglyphus angularis* (Klug) (2.8 mm); 11: *Hydroglyphus hormuzensis* nov. spec. (2.1 mm); 12: *Hydroglyphus signatellus* (Klug) (2.0 mm); 13: *Hydroglyphus sinuspersicus* Hájek & Wewalka (3.1 mm).

Hydroglyphus sinuspersicus is known from several localities in the UAE, northern Oman, and south-western Iran (Hájek & Wewalka, 2009).

***Hydroglyphus signatellus* (Klug, 1834)**

Plate 13

Specimens examined: Al-Ajban, 2 ex., 10–17.x.2005, LT & MT; 13 ex., 9.xi–7.xii.2005, LT & MT; 6 ex., 28.xii.2005–29.i.2006, LT; 10 ex., 26.ii–27.iii.2006, LT; 30 ex., 6–22.v.2006, LT; 36 ex., 5–12.vi.2006, LT; 18 ex., 19–26.vi.2006, LT; all AvH. Bithnah, 8 ex., 31.xii.2005–2.ii.2006, LT, AvH. SSW of ad-Dhaid, 32 ex., 10–29.xii.2005, LT; 2 ex., 29.xii.2005–7.i.2006, LT; 27 ex., 24–30.v.2006, LT; all AvH. Fujairah, 13 ex., 24.ii–5.iii.2005, LT; 49 ex., 13.xi–10.xii.2005, LT; 9 ex., 28.ii–1.iv.2006, LT; 3 ex., 15–22.iv.2006, LT; 284 ex., 20–27.v.2006, LT; all AvH. Fujairah, in tank at farm, 7 ex., 28.xi.2006, leg. J.-L. Gattolliat. Hatta, 1 ex., 22–29.i.2006, LT; 7 ex., 4–11.iv.2006, LT; 18 ex., 8–26.iv.2006, LT; 31 ex., 24–30.v.2006, LT; 1 ex., 17–24.viii.2006, LT; all AvH. Jebel Hafit, Green Mubazarat, thermal spring, 25 ex., 5.xii.2006, leg. J.-L. Gattolliat; 39 ex., 27.i.2010, leg. M.A. Jäch & K. Mahmood. E of Jebel Hafeet, shallow pools in desert, 318 m, 1 ex., 27.i.2010, leg. M.A. Jäch & K. Mahmood. Khatham, 1 ex., end vii.1995, LT, leg. B.J. Tigar (BMNH). Khor al-Khwair, 3 ex., 17–24.iv.2007, LT; 2 ex., 24.iv–1.v.2007, LT; 1 ex., 2–13.v.2007, LT; all AvH. Near Mahafiz, 4 ex., 21–28.iii.2006, LT; 1 ex., 4–11.iv.2006, LT; 1 ex., 19–26.iv.2006, LT; 5 ex., 21–28.viii.2006, LT; all AvH. Ra's al-Khaimah, Khuzam, 2 m, ground water pool, 28 ex., 25.i.2010, leg. M.A. Jäch & K. Mahmood. Sharjah Desert Park, 6 ex., 22.ii–9.iii.2005, LT; 10 ex., 21–29.iii.2005, LT; 41 ex., 20.x–8.xi.2005, LT; 1 ex., 13.xi–11.xii.2005, LT; 9 ex., 18.i–25.ii.2006, LT; 8 ex., 25.ii–25.iii.2006, LT; 2 ex., 21.xii.2006–23.i.2007, LT; 2 ex., 17.ii–3.iii.2007, LT; 1 ex., 3–10.iii.2007, LT; 1 ex., 10–17.iii.2007, LT; 12 ex., 8–15.iv.2007, LT; 1 ex., 15–22.iv.2007, LT; 6 ex., 20.x–24.xi.2007, LT; 5 ex., 25.v–15.vii.2008, LT; 2 ex., 30.i–3.iii.2009, LT; all AvH. Sharjah-Khor Kalba, near tunnel, 34 ex., 24–30.v.2006, LT; 6 ex., 31.v–7.vi.2006, LT; 5 ex., 7–14.vi.2006, LT; all AvH. NARC, near Sweihan, 4 ex., 16.xi–21.xii.2005, LT, AvH. Wadi Bih dam, 53 ex., 15–29.iii.2007, LT; 7 ex., 24.iv–1.v.2007, LT; 2 ex., 30.v–5.vi.2007, LT; 1 ex., 29.vi–8.vii.2008, LT; all AvH. Wadi Madaqa, 9 ex., 27.xi–22.xii.2005, LT; 3 ex., 22.xii.2005–2.ii.2006, LT; 83 ex., 2–16.ii.2006, LT; 27 ex., 27.iv–4.v.2006, LT; 122 ex., 1–8.vii.2006, LT; all AvH. Wadi Madaqa, residual pools, 386 m, 24 ex., 26.i.2010, leg. M.A. Jäch & K. Mahmood. Wadi Fara, al-Ghail env., 266 m, 1 ex., 28.ix.2007, leg. J. Batelka & H. Pinda. Wadi Safad, 7 ex., 20.xii.2005–2.i.2006, LT; 21 ex., 2–26.i.2006, WT; 26 ex., 31.i–21.ii.2006, LT; 7 ex., 15–22.iv.2006, LT; 5 ex., 14–21.v.2006, LT; 17 ex., 17–24.vi.2006, LT; 3 ex., 1–8.vii.2006, LT; all AvH. Wadi Safad, in stream, 1 ex., 28.xi.2006, leg. J.-L. Gattolliat. Wadi Shawkah, in pool, 10 ex., 27–28.xi.2006, leg. J.-L. Gattolliat; in stream and residual pools, 318 m, 18 ex., 23.i.2010, leg. M.A. Jäch & K. Mahmood. Wadi Siji, 6 ex., 24.ix–12.x.2006, WT, AvH. Wadi Wurayah, 6 ex., 18–25.iii.2007, MT, AvH; in pool and stream, 2 ex., 4.xii.2006, leg. J.-L. Gattolliat. Wadi Wurayah farm, 1 ex., 8–15.iii.2009, LT; 5 ex., 15–30.iii.2009, LT; 75 ex., 1–8.iv.2009, LT; all AvH.

Distribution: This is a widely distributed species. In northern Africa it occurs from Senegal and Morocco to Egypt, Sudan, Ethiopia and Kenya (Biström, 1986); in Europe from the whole Mediterranean area, and in Asia east to Kyrgyzstan and Pakistan (Nilsson, 2009). New to the UAE.

Tribe Hydroporini Aubé, 1836

***Nebrioporus mascatensis* (Régimbart, 1897)**

Plate 14

Specimens examined: Fujairah, 1 ex., 20–27.v.2006, LT, AvH. Hatta, 1 ex., 30.xi.2006, leg. J.-L. Gattolliat. Wadi Madaqa, pool, 13 ex., 28.xi.2006, leg. J.-L. Gattolliat. Wadi Shawkah, residual pools, 318 m, 5 ex., 23.i.2010, leg. M.A. Jäch. Wadi Wurayah, 3 ex., 26.xi.2006; in pool and stream, 1 ex., 4.xii.2006; all leg. J.-L. Gattolliat.

Distribution: This species was originally described from Oman, and subsequently recorded also from Iran and Afghanistan (Nilsson, 2009). New to the UAE.



Plates 14–17. 14: *Nebrioporus mascatensis* (Régimbart) (5.1 mm); 15: *Herophydrus musicus* (Klug) (3.6 mm); 16: *Hygrotus (Coelambus) confluens* (Fabricius) (3.4 mm); 17: *Hygrotus (Coelambus) inscriptus* (Sharp) (4.1 mm).

Tribe **Hygrotini** Portevin, 1929***Herophydrus musicus* (Klug, 1834)**

Plate 15

Specimens examined: Wadi Wurayah farm, 1 ex., 15–30.iii.2009, LT, AvH.

Distribution: This is a widely distributed Palaearctic species. It occurs in the whole Mediterranean area and subtropical parts of Asia eastward to western China and India (Nilsson, 2009). New to the UAE.

***Hygrotus (Coelambus) confluens* (Fabricius, 1787)**

Plate 16

Specimens examined: Khor al-Khwair, 1 ex., 2–13.v.2007, LT, AvH.

Distribution: A Palaearctic species distributed in the whole of Europe (except the most northern parts), northern Africa, and Asia eastward to Afghanistan and Kashmir (Nilsson, 2009). New to the UAE.

***Hygrotus (Coelambus) inscriptus* (Sharp, 1882)**

Plate 17

Specimens examined: Al Ajban, 1 ex., 10–17.x.2005, LT & MT; 4 ex., 9.xi–7.xii.2005, LT & MT; 3 ex., 28.xii.2005–29.i.2006, LT; 42 ex., 26.ii–27.iii.2006, LT; 2 ex., 2–9.iv.2006, LT; 45 ex., 6–22.v.2006, LT; 35 ex., 5–12.vi.2006, LT; 13 ex., 19–26.vi.2006, LT; all AvH. Dubai, Jebel Ali-Dubai city, salt water pools, 4 m, 2 ex., 28.i.2010, leg. K. Mahmood. Fujairah, 1 ex., 1–8.iv.2006, LT, AvH. NARC, near Sweihan, 1 ex., 16.xi–21.xii.2005, LT; 4 ex., 26.ii–2.iv.2006, LT; all AvH. Wadi Bih dam, 1 ex., 19.ii–29.iii.2007, LT, AvH. Wadi Safad, 1 ex., 27.xi–22.xii.2005, LT, AvH. Wadi Wurayah, 8 ex., 18–25.iii.2007, MT, AvH.

Distribution: This species is known from Egypt, Saudi Arabia, Syria, Iraq, Kuwait, Iran, and Turkmenistan and Uzbekistan in Central Asia (Nilsson, 2009). New to the UAE.

Tribe **Hyphydrini** Sharp, 1882***Hyphydrus pictus* Klug, 1834**

Plate 18

Specimens examined: Hatta, 1 ex., 22–29.i.2006, LT, AvH. Wadi Tarabat, Jebel Hafeet, springfed pools, 450 m, 2 ex., 27.i.2010, leg. M.A. Jäch.

Distribution: This species is known from Ethiopia and Egypt in north-eastern Africa, the Arabian Peninsula and Iran in Asia (Biström, 1982). New to the UAE.

Subfamily **Laccophilinae** Gistel, 1856Tribe **Laccophilini** Gistel, 1856***Laccophilus maindroni maindroni* Régimbart, 1897**

Plate 19

Specimens examined: Al-Hayl, 2 ex., 3.xii.2006, leg. J.-L. Gattolliat. Sharjah Desert Park, 2 ex., 29.xi.2006, leg. J.-L. Gattolliat. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH. Wadi Fara, al-Ghail env., 266 m, 1 ex., 17.iii.2007; 22 ex., 28.ix.2007; all leg. J. Batelka & H. Pinda. Wadi Madaq, pool, 1 ex., 28.xi.2006, leg. J.-L. Gattolliat; residual pools, 386 m, 13 ex., 26.i.2010, leg. M.A. Jäch. Wadi Safad, 1 ex., 21.ii–4.iii.2006, LT, AvH. Wadi Shawkah, residual pools, 318 m, 17 ex., 23.i.2010, leg. M.A. Jäch. Wadi Tarabat, Jebel Hafeet, springfed pools, 450 m, 27.i.2010, 2 ex., leg. M.A. Jäch. Wadi Wurayah, in pool and stream, 3 ex., 4.xii.2006, leg. J.-L. Gattolliat; in stream, 222 m, 2 ex., 24.i.2010, leg. M.A. Jäch. Wadi Wurayah farm, 1 ex., 1–8.iv.2009, LT, AvH.

Distribution: The nominotypical subspecies was described and is so far known only from Oman. *L. maindroni persicus* Brancucci, 1983, was described from the Iranian province of Hormozgan, and subsequently recorded also from Baluchistan province in Pakistan (Hájek, 2006). New to the UAE.



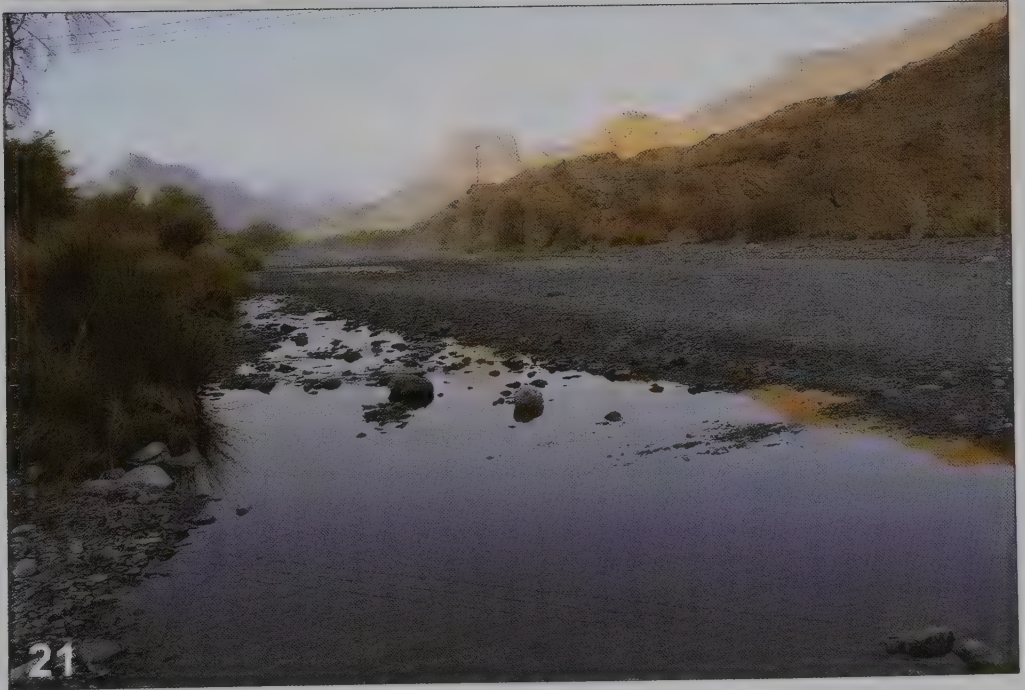
Plates 18–19. 18: *Hyphydrus pictus* Klug (4.5 mm); 19: *Laccophilus maindroni* Régimbart (4.5 mm).

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Plates 20–21. Wadi Bani Awf (Oman), the type locality of *Copelatus antoniorum* nov. spec.
(Photographs by A. Reiter)

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Authors' addresses:

- J. Hájek, Department of Entomology, National Museum, Kunratice 1, CZ-148 00 Praha 4, Czech Republic; e-mail: jiri_hajek@nm.cz
- M. Brancucci, Natural History Museum, Entomology, Augustinergasse 2, CH-4001 Basel, Switzerland; Department of Environmental Sciences, Section Biogeography, University of Basel, St. Johanns-Vorstadt 10, CH-4056 Basel, Switzerland; e-mail: michel.brancucci@unibas.ch

Order Coleoptera, family Carabidae

Corrections and the description of a new species

Ron F. F. L. Felix

INTRODUCTION

The carabid beetles of the United Arab Emirates were dealt with by Felix (2009). In this supplement we deal with several mistakes in identification made in that paper as well as additional information on some other species. *Elaphropus (Tachyura)* spec. has now been identified as *Sphaerotachys zulficari* (Schatzmayer & Koch). Some specimens mentioned by Felix (2009) under *Elaphropus (Tachyura) emeritus* (Péringuey) actually refer to a rather similar and related species that is described here as new. The specimens mentioned under *Tachys tetrphacus* Bedel actually refer to two other species, very similar to each other. *Chlaenius (Amblygenius) laeviusculus* Chaudoir and *Apristus arabicus* Mateu have to be replaced by *Chlaenius (Chlaeniellus) laeviplaga* Chaudoir and *Syntomus lateralis* (Motschulsky), respectively.

MATERIALS AND METHODS

The type specimens of the new species are deposited in the National Natural Historical Museum Naturalis, Leiden, Netherlands (NNHM) (holotype), the Museum für Naturkunde, Berlin, Germany (MNB), the collection of Petr Bulirsch, Prague, Czech Republic, the United Arab Emirates Invertebrate Collection and the collections of the authors.

Other abbreviations used: RMCA = Royal Museum for Central Africa, Tervuren, Belgium; ZMA = Zoological Museum, Amsterdam, Netherlands.

SYSTEMATIC ACCOUNT

Subfamily **Trechinae** Bonelli, 1810

Genus *Elaphropus* Motschulsky, 1839

The genus *Elaphropus* was divided into several genera by Sciaky & Vigna Taglianti (2003). The following species mentioned by Felix (2009) under the genus *Elaphropus* Motschulsky, 1839, should therefore have been classified as follows:

Elaphropus (Tachyura) biblis (Britton, 1948) = *Tachyura (Tachyura) biblis* (Britton, 1948);
Elaphropus (Tachyura) conspicuus (Schaum, 1863) = *Sphaerotachys conspicuus* (Schaum, 1863);

Elaphropus (Tachyura) babaulti (Andrewes, 1924) = *Sphaerotachys babaulti* (Andrewes, 1924);

Elaphropus (Tachyura) emeritus (Péringuey, 1898) = *Tachyura (Tachyura) emerita* (Péringuey, 1898);

Elaphropus (Tachyura) tetraspilus variabilis (Chaudoir, 1876) = *Sphaerotachys tetraspilus variabilis* (Chaudoir, 1876);

Elaphropus (Sphaerotachys) hoemorroidalis (Ponza, 1850) = *Sphaerotachys hoemorroidalis* (Ponza, 1850).

Genus *Sphaerotachys* G. Müller, 1926*Sphaerotachys zulficari* (Schatzmayer & Koch, 1934)

Felix, 2009 (p. 84, Plate 30): *Elaphropus (Tachyura)* spec.

Remarks: The species is mentioned by Felix (2009) as *Elaphropus (Tachyura)* spec. and was identified by Mr. Mahmoud Saleh Abdel-Dayem from the Departement of Entomology of the University of Cairo as *Sphaerotachys zulficari*. The specimen in the Royal Museum for Central Africa labeled as *Elaphropus (Tachyura) efflatouni* (Schatzmayer & Koch, 1934) is therefore misidentified. It is identical to *S. zulficari*.

Distribution: Egypt: Gebel Alba (Schatzmayer, 1936), Wadi Aidep (Alfieri, 1976). Not mentioned by Löbl & Smetana (2003). New to the UAE.

Genus *Tachyura* Motschulsky, 1862*Tachyura (Tachyura) emerita* (Péringuey, 1898)

Plates 1, 4

Felix, 2009 (pp. 85–86, Plate 32) dealt with *T. (T.) emerita* (as *Elaphropus (Tachyura) emeritus*). However, the species depicted in Plate 32 is not *T. emerita*, but a new species, described here below, as are some of the specimens listed. Here further illustrations of *T. (T.) emerita* are given.

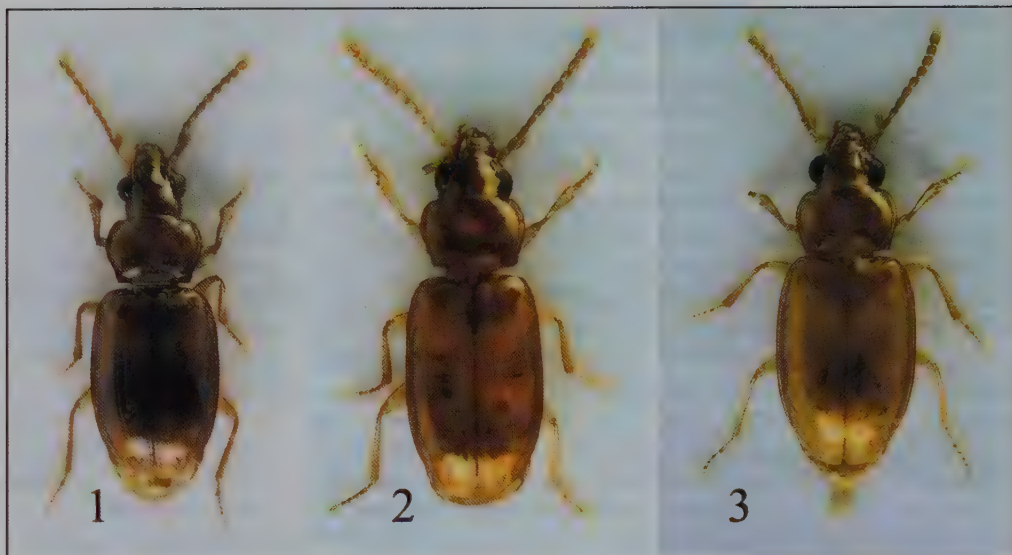
Tachyura (Tachyura) confusa Coulon & Felix nov. spec.

Plate 2, 5

Felix, 2009: *Tachyura (Tachyura) emeritus* (Péringuey, 1898) (partial misidentification).

Specimens examined: United Arab Emirates: Holotype, Sharjah Desert Park, 25°08'N 56°21'E, 4–8.xii.2004, yellow water traps, leg. A. van Harten, MNHM. Paratypes: 1 ex., same locality as holotype, 6–30.iv.2005; 1 ex., 20.x–8.xi.2005; 1 ex., 13.xi–11.xii.2005; all light trap, leg. A. van Harten. 1 ex., SSW of ad-Dhaid, 24–30.v.2006, light trap, leg. A. van Harten. 1 ex., Fujairah, 2.v–5.vi.2005; 1 ex., 5.vi–2.vii.2005, light trap, leg. A. van Harten. 11 ex., Hatta, 8–24.iv.2006, light trap, leg. A. van Harten. 1 ex., NARC, near Sweihan, 14.iii–2.iv.2005; 1 ex., 2–30.iv.2005, both light trap, leg. A. van Harten. 1 ex., Wadi Madaq, 1–8.vii.2006, light trap, leg. A. van Harten. IRAN: Hormozgan Province: 1 ex., 9 km SW of Hajiabad, 840 m., iv.2006, leg. J. Frisch. 2 ex., 6 km NE of Tall-e-Gerdu, 880 m, iv.2006, leg. J. Frisch & S. Serri, 1 ex., W of Hajiabad, Dar Agah, 1110 m, iv.2006, leg. J. Frisch & S. Serri. YEMEN: 1 ex., al-Kadan, iv.2002, light trap, leg. A. van Harten & T. Abdul Haq. 1 ex., 3 ex., Mukalla, vi.2003, light trap, leg. A. van Harten & M. Hubaishan. Seyun, vi.2002; 1 ex., 20–22.viii.2002, both light trap, leg. A. van Harten & A. Zubayri.

Description: Length holotype 1.86 mm, paratypes 1.86–2.21 mm, average 1.97 mm. Winged. Body and all the appendages entirely pale yellow. Head: Eyes a little convex, temples very short. Frontal sulci simple not deeply impressed. Microsculpture present on the frontal area, the meshes irregular, often not complete, subisodiametric, becoming obsolete at backside. Antennae short, moniliform. Labial pits lacking. Pronotum: Shiny, without microsculpture. Broader than long (HT: b max/L: 1.48, PT: 1.39–1.50, average 1.43), the basis as broad as the anterior margin. Anterior margin straight, without marked anterior angles. Sides progressively enlarged till the antero-lateral seta before the middle, then straightly narrowed till the obtuse posterior angles. (b max/b basis: HT: 1.24, PT: 1.23–1.33, average 1.28). The posterolateral seta almost on the apex of the angle which is sharp. Marginal groove ending at the posterior seta. Median sulcus hardly impressed, ended before the basis. Basal sulcus very deeply impressed not interrupted except in a rounded medial pit. Basolateral dimples continued with the antebasal declivity, postangular carina very short, hardly visible. Elytrae: Shiny, without visible microsculpture. Relatively narrow (L/b: HT: 1.65, PT: 1.51–1.71, average 1.6), hardly convex, their sides almost parallel. Shoulders rounded but well marked, the basal margin

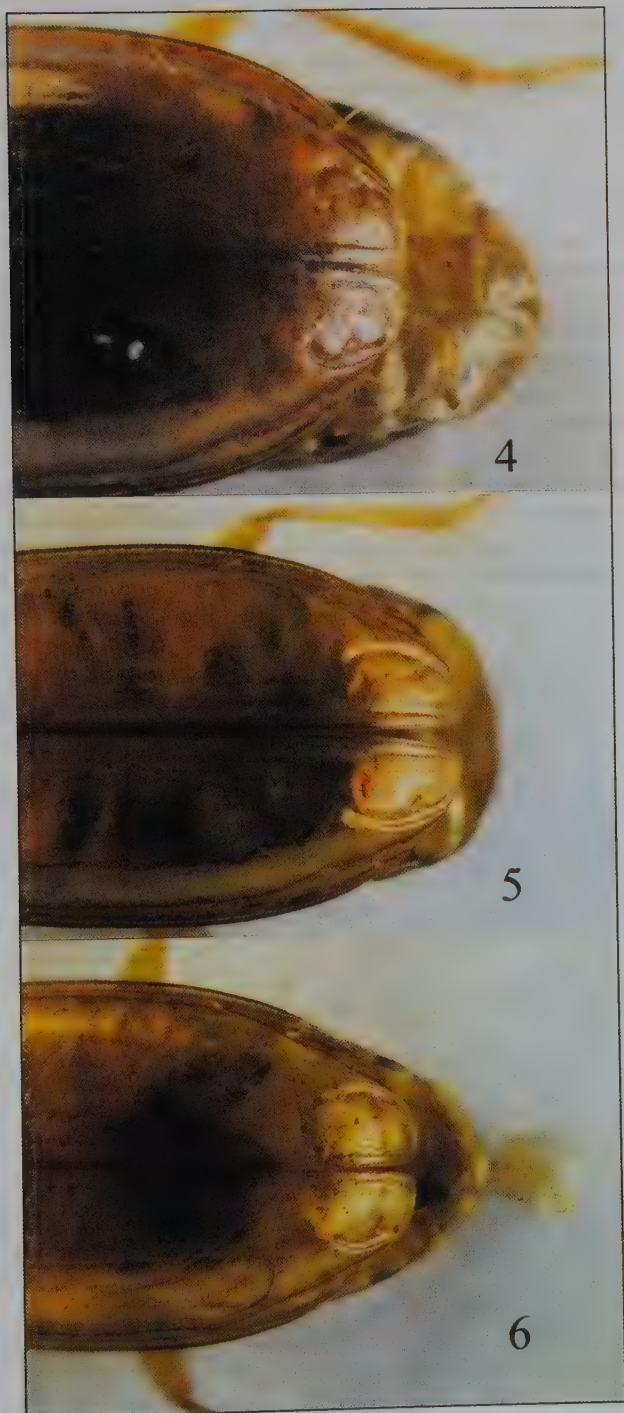


Plates 1–3. 1: *Tachyura (Tachyura) emerita* (Péringuey); 2: *Tachyura (Tachyura) confusa* Coulon & Felix nov. spec.; 3: *Tachyura biblis* (Britton).

perpendicular to the suture. Two punctate striae well impressed, stria 1 entire, stria 2 shortened before the basis and the apex. The stria 3 is poorly impressed, very faint beyond 1st and 2nd discal setae, stria 4 hardly visible with some sparse punctures. The 8th stria entire, the recurrent one weakly but regularly arcuated, rather long and stretched (Plate 5), without a pit at its end. All the elytral setae show the typical pattern of the genus *Tachyura* (cf. Sciaky & Vigna Tagliani, 2003).

Differential diagnosis: This new species is near *Tachyura biblis* (Britton, 1948) (Plates 3, 6) and *T. emerita* (Péringuey, 1898). It can be differentiated from those species by the following characters:

- Eyes a little convex. They are well convex but less than in *T. biblis*, strongly convex and hemisphaeric in *T. emerita*.
- Microsculpture present on the head, absent in *biblis* and *emerita*.
- Shape of the pronotum, particularly the sides are not sinuated and the posterior angles are obtuse. In *biblis*, the sides are slightly sinuated and the posterior angles are subrectangular, the basis is very large ($b \text{ max}/b \text{ basis} \approx 1.10\text{--}1.17$), larger than the anterior margin. In *emerita*, the sides are strongly sinuated, the basis is strongly narrowed, narrower than the anterior margin, the posterior angles are somewhat obtuse but their apex is very sharp. In these both species, the lateral groove is ended at the postlateral seta clearly before the posterior angles. In *emerita* moreover, the lateral edge is slightly thickened and convex just before this angle. In *biblis* and *emerita*, the basal sulcus of the pronotum is interrupted by three pits.



Plates 4–6. Recurrent striae. 4: *Tachyura (Tachyura) emerita* (Péringuey); 5: *Tachyura (Tachyura) confusa* Coulon & Felix nov. spec.; 6: *Tachyura biblis* (Britton).

- Elytral shape. The elytrae are narrower and longer than in both other species. In *biblis* the elytrae are shorter ($L/b \approx 1.50\text{--}1.54$), more convex, their sides are regularly ovate, the basal margin is convex and oblique in respect to the suture. In *emerita* the elytrae are also a bit shorter ($L/b \approx 1.47\text{--}1.55$) and their sides are less ovate than in *biblis*.
- In *biblis*, the recurrent stria is regular, more arcuated and shorter (Plate 6). In *emerita* the recurrent stria is longer, almost straight in the middle and strongly arcuated at the end (Plate 4). In both species the stria is ending in a small deepened pit.

Some additional characters can also be mentioned:

- Elytral striae. In *biblis* and *emerita* there are at least 3 well impressed striae and in *biblis* even 4. This character could be individually variable.
- The size is generally somewhat smaller than that of *T. biblis* (≈ 2.2 mm), but about the same as of *T. emerita*.
- The new species is slender, flatter and more parallel-sided than the two others, especially than *T. biblis* which is clearly stouter and more convex and with ovate elytrae.

Remarks: The new species had been observed by Jacques Coulon in 2009 as four different specimens among many specimens of Tachyini from Iran. Until now those specimens had not been named. Initially, the new species was confused with *Tachyura biblis* and *Tachyura emerita*. Now the same species was recognized among material from the UAE. In RMCA we compared this new species with specimens of *Tachyura emerita priesneri* (Schatzmayer & Koch, 1934) and the holotype and paratypes of *Tachyura motoensis* (Burgeon, 1935). The latter two species were very similar to *T. emerita* s. str. and quite different from the new species.

We were reluctant to describe the species as new, but we were not able to discover any taxon which could correspond to that beetle, neither in several institutional collections such as ZMA, NNHM and RMCA, nor in the paper and identification key for the Oriental *Tachys* by Andrewes (1925).

Etymology: The name '*confusa*' was chosen because of the confusing resemblance with *T. (T.) emerita*.

Genera *Tachys* Dejean, 1821, and *Polyderis* Motschulsky, 1862

Sciaky & Taglianti (2003) upgraded the subgenus *Polyderis* to genus rank. Therefore the species mentioned by Felix (2009) under the genus *Tachys* should have been classified as follows:

Tachys (Tachys) lenkoranus Csiki, 1928 = *Tachys lenkoranus* Csiki, 1928

Tachys (Tachys) tetrphacus Bedel, 1896 = *Tachys tetrphacus* Bedel, 1896

Tachys (Tachys) torretassoi Schatzmayer & Koch, 1934 = *Tachys torretassoi* Schatzmayer & Koch, 1934

Tachys (Polyderis) brevicornis Chaudoir, 1846 = *Polyderis brevicornis* Chaudoir, 1846

Tachys (Polyderis) impressipennis Motschulsky, 1859 = *Polyderis impressipennis* Motschulsky, 1859

Tachys tetrphacus Bedel, 1896

The status of the species dealt with as *T. (T.) tetrphacus* by Felix (2009) is not quite clear. It is possible that the specimens attributed to this species turn out to belong to two other

species. This matter is under investigation and will be dealt with later. For the moment the occurrence of *T. tetraphacus* in the UAE is not certain.

Genus *Chlaenius* Bonelli, 1810

Chlaenius (Chlaeniellus) laeviplaga Chaudoir, 1876

Felix, 2009: *Chlaenius (Amblygenius) laeviusculus* Chaudoir, 1856 (misidentification).

Diagnosis: Length 13 mm. Labrum yellow with dark borders; epipleurae yellow with broad dark border in first quarter. Palps, antennae and legs yellow. Head smooth with fine punctures. Pronotum coarsely punctured and pubescent along sides, deep middle line and deep basal furrows that reach up to the middle of the pronotum. Elytrae blackish green, coarsely punctured and pubescent; border and apex of elytrae yellow.

Remarks: The specimen dealt with in Felix, 2009 (p. 100, Plates 54 & 56) under the species name *Chlaenius (Amblygenius) laeviusculus* Chaudoir, 1856, actually refers to *C. (C.) laeviplaga*, as was kindly pointed out by both Riccardo Sciaky (in litt.) and Erich Kirschenhofer (in litt.). Mandl (1980) described the subspecies *C. (C.) saudiarabicus*, which differs from the nominate form by the shape of the border of the pronotum near the posterior angles, which is straighter, and the size of the apical yellow spot, which is up to 1/3 or more of the elytra. The specimen from the UAE obviously belongs to the subspecies *saudiarabicus*.

Distribution: Eritrea, Egypt. The subspecies *saudiarabicus* is mentioned from Saudi Arabia. New for the UAE.

Chlaenius (Amblygenius) laeviusculus has to be removed from the list of Carabidae from the UAE.

Genus *Anthracus* Motschulsky, 1850

Anthracus vanharteni Jaeger & Felix, 2009, and *Anthracus angusticollis* Péringuey, 1908

In Felix (2009: 109) the numbers of the plates were interchanged: Plate 71 represents *A. angusticollis* and Plate 72 represents *A. vanharteni*.

Genus *Syntomus* Hope, 1838

Syntomus lateralis (Motschulsky, 1855)

Felix, 2009: *Apristus arabicus* Mateu, 1986 (misidentification).

Remarks: The specimens dealt with by Felix, 2009 (p. 120, Plate 104) under the species name *Apristus arabicus* Mateu, 1986, actually refer to *S. lateralis*. Both Riccardo Sciaky (in litt.) and Mr. David Wrase (in litt.) kindly pointed out that beetle in the photograph was not a species of *Apristus*.

Diagnosis: Length 4.5–5.0 mm. Head black, pronotum piceous brown. Elytrae yellow with yellow shoulders up till the 2nd humeral pore. From there with dark brown border of elytrae, from 2nd humeral pore on rapidly dark brown till 5th interval, apex and 1st interval dark brown. Area of scutellum dark brown in triangular shape. Striae very fine, very weakly punctured, almost fading towards apex, neck, pronotum and elytrae with strong and very broad transverse meshes, on head more isodiametric towards labrum and between the eyes. All appendices yellow.

Distribution: North Africa (Morocco, Algeria, Tunisia, Libya, Egypt) and Middle East (Iran, Iraq, Israel, Syria, Saudi Arabia). Not mentioned for the UAE by Löbl & Smetana (2003).

Apristus arabicus Mateu, 1986, has to be removed from the list of Carabidae from the UAE.

ACKNOWLEDGEMENTS

The author and Jacques Coulon would like to thank Johannes Frisch, who sent for study the specimens he collected, and Riccardo Sciaky, who draw attention to the new species and let us describe it. The author also likes to thank Jacques Coulon, Riccardo Sciaky, Erich Kirschenhofer and David Wrase for their attentiveness, their critical cooperation and friendly support.

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Author's address:

R.F.F.L. Felix, Hazelaarlaan 51, 5056XP Berkel Enscht, Netherlands; e-mail: r.felix3@kpnplanet.nl

Order Coleoptera, family Staphylinidae

Subfamily Pselaphinae

Claude Besuchet and Giulio Cuccodoro

INTRODUCTION

The first Pselaphinae of the Arabian Peninsula were found by Dr. Millingen in Taïf (Saudi Arabia), which lies in the mountains of Hedjaz alongside the Red Sea; they were described by A. Raffray (1887) as *Enoptosomus nitidulus*, *Desimia arabica* and *Psilocephalus lewisi*, together with *Ctenistes parviceps* from the Oasis of the Hadj, in the vicinity of Aden (Yemen). Later, *Trissemus brittoni* Jeannel, 1951, *Parabatrissus scotti* Jeannel, 1951, *Brachygluta tumidipes* Besuchet, 1981, and *Trissemnus maroccanus wittmeri* Besuchet, 1981, were described from Saudi Arabia, bringing the total of species of pselaphines from this large country to eleven.

In the present study, based on extensive collections from the United Arab Emirates made during the last decade by A. van Harten, we recognize a total of seventeen species of Pselaphinae, of which 10 are new to science: *Biblopectus eximius* nov. spec., *B. gracilentus* nov. spec., *B. incredibilis* nov. spec., *Centrophthalmus persimilis* nov. spec., *C. tempestivus* nov. spec., *Commatocerus concinnus* nov. spec., *Ctenisomorphus fortipalpis* nov. spec., *Enoptostomus arabicus* nov. spec., *Philotrimium disseminatum* nov. spec., and *Trissemus vanharteni* nov. spec.. In addition, *Ctenisoschema* Jeannel, 1956, a monotypic genus based on *Ctenisomorphus garamantica* Peyerimhoff, 1929, is synonymized with *Ctenisomorphus* Raffray, 1890 (nov. syn.).

In the studied material the most frequent species from the United Arab Emirates was *Enoptostomus arabicus* (226 specimens), while four species were represented by not more than two individuals (*Biblopectus incredibilis*, *Centrophthalmus persimilis*, *C. tempestivus*, *Commatocerus concinnus*).

MATERIALS AND METHODS

This study is based on a total of 602 specimens, of which 568 from the United Arab Emirates. The type material of the new species is deposited in the Muséum d'histoire naturelle, Geneva, Switzerland (MHNG) and in the Národní Muzeum, Prague, Czech Republic (NMPC). Unless specified, the paratypes and additional material collected in the United Arab Emirates are deposited in MHNG and the United Arab Emirates Invertebrate Collection (UAEIC). Abbreviations used: AvH = leg. A. van Harten; LT = light trap; MT = Malaise trap; WT = water traps.

SYSTEMATIC ACCOUNT

Subfamily **Pselaphinae** Latreille, 1802

Tribe **Trichonychini** Reitter, 1882

Genus *Philotrimium* Blattný, 1905*Pseudozibus* Jeannel, 1956

The genus *Philotrimium* Blattný, 1925 contains five species: *P. abdominale* (Motschulsky, 1851) from Burma, *P. crassipes* (Raffray, 1908) from Italy, *P. longicolle* (Jeannel, 1958) from Japan, *P. simplicipenne* (Jeannel, 1958) from Zaire, and *P. disseminatum*, which is described below.

Philotrimium disseminatum Besuchet & Cuccodoro **nov. spec.**

Plate 1, Figures 1–3

Specimens examined: Holotype: ♂ (MHNG), "UNITED ARAB EMIRATES, Wadi Safad <25.13N; 56.19E> 15–22.04.2006, leg. A. van Harten, in light-trap, UAE 8256". Paratypes (42): 1♂; same data as holotype, but 31.i–21.ii.2006. 1♀, al-Ajban, 9.xi–7.xii.2005, LT & MT, AvH; 1♀, 6–22.v.2006, LT, AvH; 1♀, 7–28.xii.2006, LT & MT, AvH. 1♂, Fujairah, 28.ii–1.iv.2006, LT, AvH; 3♂, 3♀, 8–29.iv.2006, LT, AvH; 1♂, 15–22.iv.2006, LT, AvH; 6♂, 20–27.v.2006, LT, AvH. 1♂, Hatta, 24–30.ii.2006, LT, AvH. 1♂, 4–11.iv.2006, LT, AvH. 1♀, near al-Hayer 30.01.2005, from leaf litter, AvH. 1♂, 1♀, near Mahafiz, 29.xii.2005–7.ii.2006, LT, AvH. 4♂, 1♀, Sharjah, 27.iv–5.vi.2005, LT, AvH. 1♀, Sharjah Desert Park, 29.iii–6.iv.2005, LT, AvH. 3♂, 2♀, Wadi Bih dam, 24.iv–1.v.2007, LT, AvH; 1♀, 6–13.v.2007, LT, AvH. ISRAEL: 4 ♀, Galilea, Jinosar, –200m, 28.iv.1982, in leaf litter, leg. C. Besuchet & I. Löbl (MHNG). 1♀, Jordan Valley, Bet She'an, The Hawwat "Eden Agricultural Experiment Station", vi.1986, LT, leg. Q. Argaman (MHNG); 1♀, same data but 15.vii.1990 (MHNG). YEMEN: 1♂, Ta'izz, xi.1999, LT, AvH & A. Awad (MHNG).

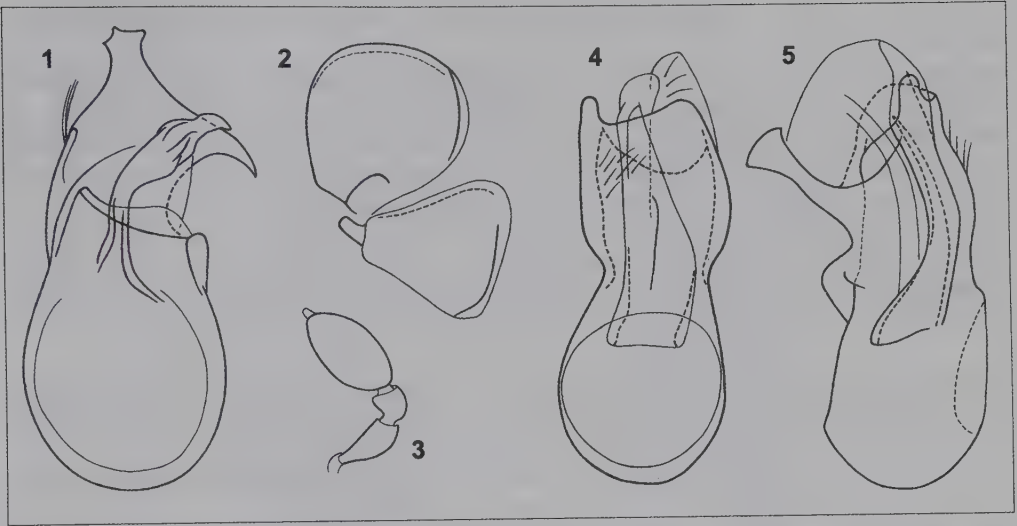
Description: Body (Plate 1) 1.00–1.10 mm long, rather convex, uniformly pale reddish-brown, with pubescence on pronotum, elytra and abdomen short and recumbent. Eyes well developed, protruding. Maxillary palpi as in Figure 3. Antennae (length 0.28 mm) with article 3 slightly longer than wide, 4–8 all similar and distinctly wider than long, 9 slightly wider and distinctly wider than long; club (length 0.11 mm) consisting of two articles (10 and 11), the penultimate almost as wide as the terminal and wider than long. Interocular fovae small, but well marked. Pronotum (length 0.25 mm; width 0.22 mm) with a pair of minute laterobasal fovae. Elytra (length 0.35 mm; combined width 0.39 mm) with the two sutural striae entire, lacking basal fovae. Abdomen (length 0.40 mm; width 0.36 mm) characterized by first visible tergite (length 0.18 mm; width 0.36 mm) larger, bearing two minute basal carinae separated from each other by 0.15 mm. Legs rather long and slender. Metathoracic wings membranose and well developed. Pro-, meso- and metacoxae contiguous.

Male. Eyes slightly wider than female (0.05/0.08 mm). Mesotibiae very slightly notched on apical third. Aedeagus as in Figure 1 (length 0.26–0.28 mm) asymmetrical. Operculum (last ventrite) rounded, with an hemisternite on each side (Fig. 2).

Comments: *Philotrimium disseminatum* resembles the only other West Palaearctic member of the genus, *P. crassipes* (Raffray, 1908), from which it differs by its body being less convex with a slightly longer pronotum, by the absence of interocular pits, by the eyes being markedly smaller, and by the antennomeres ten short and transverse. Its aedeagus is also smaller and almost symmetrical.

Tribe *Euplectini* Streubel, 1839Genus *Biblopectus* Reitter, 1882

Almost all the *Biblopectus* of the West Palaearctic region (32 species) have the body blackish, or dark brown, while the three new species described below from the United Arab Emirates all have the body pale yellow-brown. These very small filiform Pselaphines show very little external interspecific differences, but their very complex aedeagi facilitate their identification.



Figures 1–5. 1–3: *Philotrimium disseminatum* nov. spec. 1: Aedeagus in dorsal view; 2: Operculum with one hemisternite; 3: Maxillary palpus. 4, 5: *Leptoplectus remyi* (Jeannel). 4: Aedeagus in dorsal view; 5: Aedeagus in lateral view.

***Biblopectus eximius* Besuchet & Cuccodoro nov. spec.**

Plate 2, Figures 9–11

Specimens examined: Holotype: ♂ (MHNG): “UNITED ARAB EMIRATES, Fujairah <25.08N; 56.21E> 28.02–01.04.2006, leg. A. van Harten, in light-trap, UAE 4149”. Paratypes (44): 5♂, 12♀, same data as holotype; 1♀, same data, but 8.xii.2005–2.i.2006; 1♂, 1♀, same data, but 28.ii–21.iii.2006; 1♂, 2♀, same data, but 1–8.iv.2006; 3♂, 5♀, same data, but 8–29.iv.2006; 1♀, same data, but 15–22.iv.2006; 2♀, same data, but 10–17.vi.2006. 2♀, Wadi Madaq, 2–16.ii.2006, LT, AvH; 3♂, 4♀, 1–8.vii.2006, LT, AvH. 1♀, Wadi Wurayah farm, 22.ii–2.iii.2009, LT, AvH.

Description: Body (Plate 2) 0.90–1.00 mm long. Head 0.19 mm wide. Pronotum as wide as long (length 0.19 mm; width 0.20 mm). Elytra 0.29–0.30 mm long.

Male. Metaventrite with a medial depression shallow and quite large. Mesofemora stout, 0.06 mm wide. Posterior margin of abdominal sternite 4 with narrow and deep medial notch (width 0.04 mm). Aedeagus as in Figures 9 and 10 (length 0.17–0.18 mm). Operculum (last ventrite) as in Figure 11.

Female. Pygidium rounded, bearing a black minute spike.

Comments: *Biblopectus eximius*, *B. gracilentus* and *B. incredibilis* are the only members of the genus having the body pale yellow-brown. *Biblopectus eximius* can be distinguished from *B. gracilentus* nov. spec. and *B. incredibilis* nov. spec. by the shape of the male abdominal sternite four, which has the posterior margin not notched medially. The shape of its aedeagus is diagnostic.

***Biblopectus gracilentus* Besuchet & Cuccodoro nov. spec.**

Figures 6–8

Specimens examined: Holotype: ♂ (MHNG): “UNITED ARAB EMIRATES, Hatta <24.49N; 56.87E> 04–11.04.2006, leg. A. van Harten, in light-trap, UAE 8473”. Paratypes (16): 4♂, 6♀, same data as holotype; 1♀, same data, but 24–30.iii.2006. 1♂, al-Ajban, 9.xi–7.xii.2005, LT & MT, AvH; 1♂, 1♀,

6–22.v.2006, LT, AvH. 1♀, Sharjah Desert Park, 22.xi.2004, beaten from vegetation, AvH; 1♂, 23.iii–6.iv.2005, LT, AvH.

Description: Body (similar to Plate 2) 0.80–0.90 mm long. Head 0.18 mm wide. Pronotum slightly wider than long (length 0.16 mm; width 0.19 mm). Elytra 0.26–0.27 mm long.

Male. Metaventricle evenly convex, without medial depression. Mesofemora 0.04 mm wide. Posterior margin of abdominal sternite 4 slightly triangular in middle, entire. Aedeagus as in Figures 6 and 7 (length 0.12–0.13 mm). Operculum (last ventrite) as in Figure 8.

Female. Pygidium triangular, apically rounded.

Comments: *Biblopectus gracilentus* and *B. incredibilis* have the male abdominal sternite four medially notched, while it is entire in *B. eximius*. The shape of their aedeagus is diagnostic. See comments under *B. eximius*.

***Biblopectus incredibilis* Besuchet & Cuccodoro nov. spec.**

Figures 12, 13

Specimens examined: Holotype: ♂ (MHNG): “UNITED ARAB EMIRATES, Wadi Bih dam <25.48N; 56.04E> 01–15.03.2007, leg. A. van Harten, in light-trap, UAE 10297”.

Description: Body (similar to Plate 2) 1.10 mm long. Head 0.30 mm wide. Pronotum as wide as long (length 0.20 mm; width 0.21 mm). Elytra 0.31 mm long.

Male. Metaventricle with a medial depression shallow and narrow. Mesofemora stout, 0.06 mm wide. Posterior margin of abdominal sternite 4 with narrow and deep medial notch (width 0.05 mm). Aedeagus as in Figure 12 (length 0.17–0.18 mm). Operculum (last ventrite) as in Figure 13.

Female. Unknown.

Comments: See comments under *B. eximius* and *B. gracilentus*.

Genus *Leptoplectus* Casey, 1908

The genus *Leptoplectus* contains fifteen species from the Palearctic, East Nearctic, Oriental and South Pacific regions. One of them occurs in the UAE.

***Leptoplectus remyi* (Jeannel, 1961).**

Plate 3, Figures 4, 5

Specimens examined: (35): Fujairah, 1♂, 8.xii.2005–2.i.2006; 4♂, 3♀, 28.ii–1.iv.2006; 3♀, 1–8.iv.2006; 6♂, 8♀, 8–29.iv.2006; 1♂, 15–22.iv.2006; 1♂, 2♀, 20–27.v.2006; 2♀, 10–17.vi.2006; all LT, AvH. Hatta, 1♀, 22–29.i.2006, LT, AvH. Sharjah, 2♂, 1♀, 28.vi–23.vii.2005, LT, AvH.

Diagnosis: Aedeagus as in Figures 4 and 5.

Distribution: This Pselaphine described from Sri Lanka has subsequently been recorded from India, Nepal, Japan, Senegal (in rotting wood of baobab), Switzerland (in composts) (Besuchet, 1999), and now also from the UAE.

Tribe *Brachyglutini* Raffray, 1904

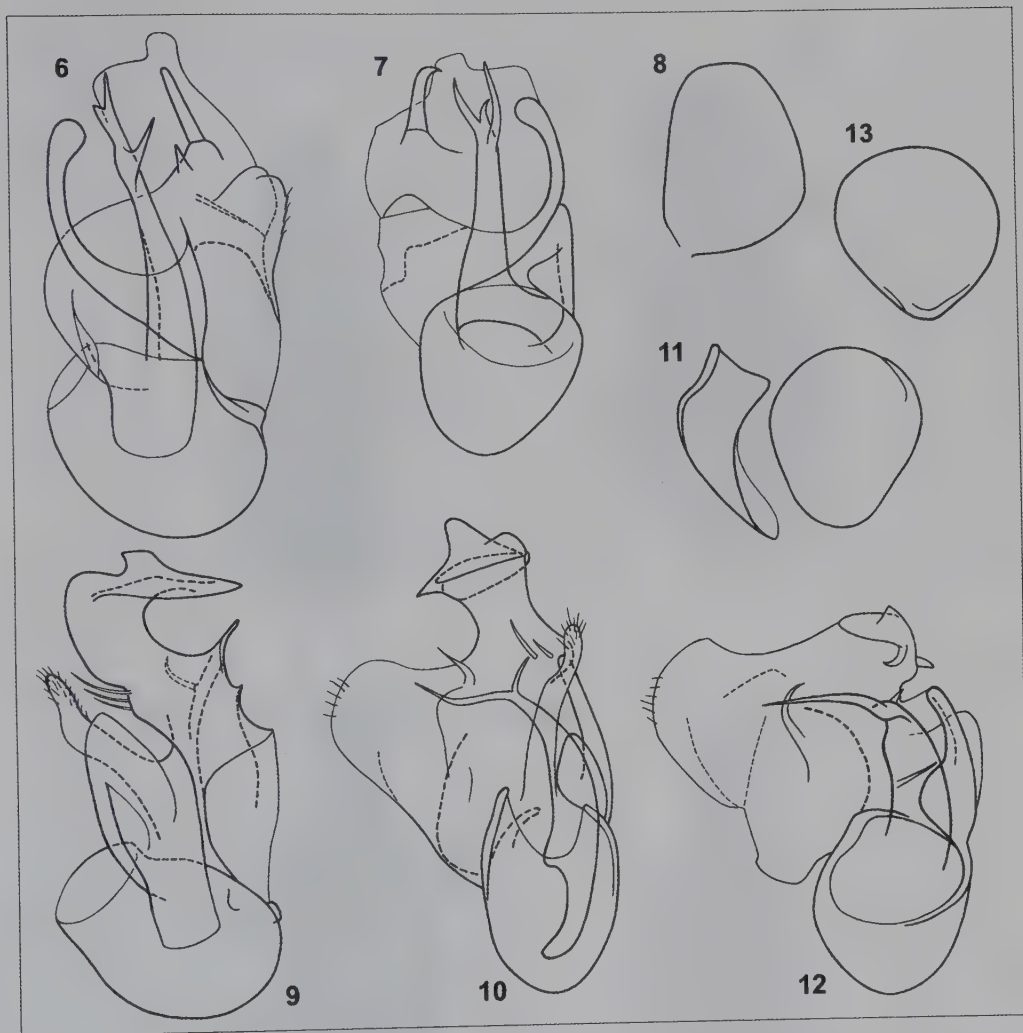
Genus *Brachygluta* Thomson, 1859

Brachygluta contains over one hundred species from the Afrotropical, Holarctic and Oriental regions. *Brachygluta larica* Sabella, 2004 (p. 75; p. 206: Fig. 125) and *B. martinae* Bückle, 2004 (p. 136; p. 206: Fig. 191) have been described recently from the South of Iran, where they were found near partially dry rivers. These two species also occur in the UAE.

***Brachygluta larica* Sabella, 2004**

Plate 4

Specimens examined: (2): 1♂, 1♀, Hatta, 4–11.iv.2006, LT, AvH.



Figures 6–13. 6–8: *Biblopectus gracilentus* nov. spec. 6: Aedeagus in lateral view; 7: Aedeagus in dorsal view; 8: Operculum. 9–11: *Biblopectus eximius* nov. spec. 9: Aedeagus in lateral view; 10: Aedeagus in dorsal view; 11: Operculum with one hemisternite. 12–13: *Biblopectus incredibilis* nov. spec. 12: Aedeagus in dorsal view; 13: Operculum.

***Brachygluta martinae* Bückle, 2004**

Specimens examined: (2): Wadi Siji, 1♂, 24.ix–22.x.2006, WT, AvH. Sharjah-Khor Kalba, near tunnel, 7–22.iii.2006, LT, AvH.

Plate 5

Genus *Trissemus* Jeannel, 1949

Trissemus is a large genus of Pselaphinae containing some one hundred and thirty species from the African, Palaearctic and Oriental regions. It is represented in the UAE by two species.



Plates 1–4. 1: *Philotrimium disseminatum* nov. spec., habitus; 2: *Biblopectus eximius* nov. spec., habitus; 3: *Leptoplectus remyi* (Jeannel), habitus; 4: *Brachygluta larica* Sabella, habitus. Scale bars = 1 mm.

***Trissemus maroccanus maroccanus* (Raffray, 1904)**

Specimens examined: (28): Fujairah, 1♂, 8–29.i.2006, LT, AvH. Hatta, 1♂, 19–28.iii.2006; 1♂, 24–30.iii.2006; 7♂, 6♀, 8–26.iv.2006; all LT, AvH. Near Mahafiz, 1♂, 2.ii–2.iii.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♂, 2♀, 7–22.iii.2006, LT, AvH; 1♂, 4♀, 31.v–7.vi.2006, LT, AvH. Wadi Safad, 1♂, 17–24.vi.2006, LT, AvH. Wadi Wurayah, 1♀, 12–14.iv.2005, MT & WT, leg. T. Pape. Wadi Wurayah farm, 1♀, 15–30.iii.2009, LT, AvH.

Comments: This *Trissemus* has a predilection for desertic regions. It is known from Morocco (South), Algeria (Tassili), Tunisia (South), Saudi Arabia, Oman, and now also from the UAE.

***Trissemus vanharteni* Besuchet & Cuccodoro nov. spec.**

Plate 6, Figure 14

Specimens examined: Holotype: ♂ (MHNG): "UNITED ARAB EMIRATES, Wadi Madaq <25.18N; 56.07E> 27.04–05.05.2006, leg. A. van Harten, in light-trap, UAE 6509".

Paratypes (67): 29♂ & 16♀, same data as holotype. 1♂, 3♀, Hatta 4–11.iv.2006, LT, AvH. 2♂, near Mahafiz, 21–28.viii.2006, LT, AvH. 1♂, Sharjah-Khor Kalba, near tunnel, 7–22.iii.2006; 1♂, 31.v–7.vi.2006; 1♂, 7–14.vi. 2006; all LT, AvH. 2♂, Wadi Madaq, 27.iv–4.v.2006, LT, AvH. 2♀, Wadi Safad, 20.xii.2005–2.i.2006; 1♂, 31.i–21.ii.2006; 1♂, 15–22.iv.2006; 1♂, 17–24.vi.2006; 2♂, 2♀, 1–8.vii.2006; all LT, AvH. 1♂, Wadi Wurayah farm, 15.i–22.ii.2009, LT, AvH.

Description: Body (Plate 6) 1.75–1.90 mm long, uniformly pale reddish-brown, with pronotum, elytra and abdomen smooth and impunctate, covered with pubescence short and recumbent. Head (length 0.38 mm; width 0.39 mm) dorsally flattened, with three deep foveae of similar dimensions. Temples short, rounded. Eyes (0.15/0.14 mm) well developed, protruding. Maxillary palpi with last article 0.12 mm long and 0.07 mm wide. Antennae moderately long (0.79 mm) with articles 3–5 about 1.5 times longer than wide, 6 slightly shorter, 7 slightly wider than long, 8 markedly wider than long; club consisting of three articles (9–11), with article 9 slightly wider than flabellum and transverse, article 10 markedly wider than 9 and transverse, and terminal article in female almost two times longer than wide (length 0.18 mm; width 0.10 mm). Pronotum (length 0.35 mm; width 0.39 mm) almost spherical, with a pair of deep lateral foveae and a minute mediobasal fovea. Elytra (length 0.63 mm; combined width 0.78 mm) each with three minute laterobasal foveae prolonged mesally by sutural stria entire and externally by dorsal stria extended nearly to posterior margin. Abdomen (length 0.65 mm; width 0.72 mm) rather convex, characterized by first visible tergite (length 0.35 mm) bearing on basal third two slightly diverging carinae separated from each other at base by an interval slightly larger than third of basal tergal width. Male. Terminal antennomere (length 0.23 mm; width 0.12 mm) bearing internally on basal third a shallow depression bordered with a fine carina. Mesotibiae slightly enlarged in middle, bearing a robust subapical spur (length 0.07 mm). Aedeagus as in Figure 14 (length 0.32–0.35 mm).

Comments: The species is well characterized from *T. maroccanus* by the shape of the parameres and the structure of the internal sac of the aedeagus.

Etymology: The species is named after Antonius van Harten, Sharjah, UAE.

Tribe Ctenistini Blanchard, 1845**Genus *Epicaris* Reitter, 1882**

This African genus contains only two species: *E. crassicornis* Raffray, 1913, from South Africa, and *E. ventralis* (Raffray, 1882), which is widely distributed in the African continent.

***Epicaris ventralis* (Raffray, 1882).**

Plate 7

Specimens examined: (32): Near Mahafiz, 1♂, 29.xii.2005–7.ii.2006; 2♂, 24–30.iv.2006; 1♂, 21–28.viii.2006; 1♂, 7–14.ix.2006; all LT, AvH. Sharjah Desert Park, 1♀, 21.vii–5.viii.2005; 1♀, 28.v–4.vi.2007; 2♂, 20.x–24.xi.2007; all LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♂, 1♀, 7–22.iii.2006; 1♀, 24–30.v.2006; 2♂, 7–14.vi. 2006; all LT, AvH. Wadi Bih dam, 1♀, 6–13.v.2007, LT, AvH. Wadi Madaq, 3♂, 28.i.2006, from leaf litter, AvH; 4♂, 1♀, 27.iv–5.v.2006, LT, AvH. Wadi Safad, 1♀, 31.i–21.ii.2006, LT, AvH; 1♀, 21.ii–4.iii.2006, LT, AvH. Wadi Wurayah farm, 1♂, 15.i–22.ii.2009; 4♂, 1♀, 8–15.ii.2009; 1♂, 15–30.iii.2009; all LT, AvH.

Genus *Ctenistes* Reichenbach, 1816

Ctenistes contains some thirty species from the African, Palaearctic and Oriental regions, of which one has been found in the UAE.

***Ctenistes staudingeri* Schauffuss, 1861.**

Plate 8

***Ctenistes parviceps* Raffray, 1887**

Specimens examined: (12): Fujairah, 2♀, 28.ii–1.iv.2006; 2♂, 1♀, 1–8.iv.2006; 1♀, 8–29.iv.2006; 1♂, 2♀, 15–22.iv.2006; 1♂, 20–27.v.2006; 2♂, 13.xi–10.xii.2006; all LT, AvH.

Comments: This species described from Spain (Andalusia) is widespread in the Maghreb from Morocco to Tunisia and Tibesti; it is also known from Yemen, Saudi Arabia, Israel, Iraq and Iran, and now also from the United Arab Emirates.

Genus *Ctenisomorphus* Raffray, 1890***Ctenisoschema* Jeannel, 1956 *nov. syn.***

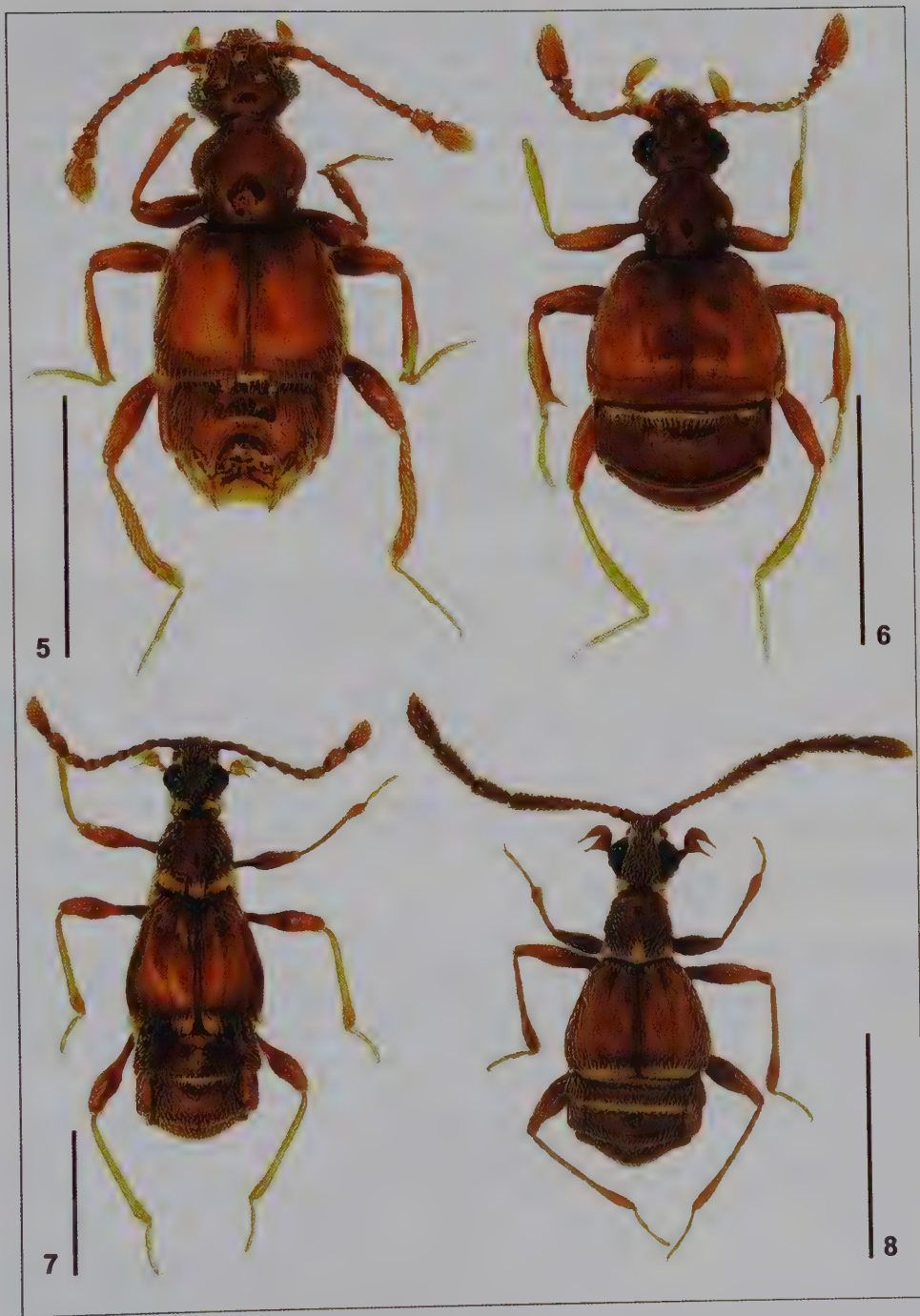
Species of *Ctenisomorphus* exhibit considerable variations with respect to the development of several structures, notably the maxillary palpi and the antenna club, which are occasionally affected by individual variations, or disharmonic growth (Besuchet, 1981: 247–249). Jeannel (1957) erected the monotypic genus *Ctenisoschema* to accomodate *Ctenisomorphus garamantica* Peyerimhoff, 1929 (type species, by monotypy) because this taxon has the antennal club consisting of four antennomeres, instead of two in the other *Ctenisomorphus*. However, these genera share in common all the other features, notably a characteristic shape of the antennomeres ten and eleven, which are about four times longer than wide, with the tenth notched basally. We therefore consider that *Ctenisoschema* is a new junior synonym of *Ctenisomorphus*. Thus, the genus now contains *C. garamantica* Peyerimhoff, 1929, from Algeria and Morocco, *C. major* (Raffray, 1877) from Africa, the Middle East and the Arabian Peninsula, and the new species described below.

Ctenisomorphus fortipalpis* Besuchet & Cuccodoro *nov. spec.

Plate 10, Figs 15, 16

Specimens examined: Holotype: ♂ (MHNG), “UNITED ARAB EMIRATES, Wadi Wurayah farms <25.24N; 56.17E> 15–30.03.2009, leg. A. van Harten, in light-trap, UAE 10894”. Paratypes (26): 1♂, Wadi Madaq, 27.iv–5.v.2006, LT, AvH; 1♀, 1–8.vii.2006, LT, AvH. IRAN: 4♂, 6♀ (MHNG, NMPC), Southeast, Bahu-Kalat, 3–4.iv.1973, Exped. Nat. Mus. Praha, n° 147; 1♂ (NMPC), same data, but Tis, 6–7.iv.1973, n° 150; 2♂ (NMPC), same data, but 13 km SSE of Nikshahr, river, 8–9.iv.1973, n° 152; 2♀ (NMPC), same data, but 25 km W of Ghasre-ghand, river, 9–10.iv.1973, n° 153; 1♂ (MHNG), same data, but 9 km S of Espakeh, 10.iv.1973, n° 155; 1♂, 1♀ (MHNG); same data, but South, Derpehan, 12 km E of Senderk, 11–12.v.1977, n° 326; 1♀ (MHNG), same data, but Kahurak, 2–3.vi.1977, n° 355; 3♂, 2♀ (MHNG, NMPC), same data, but Ziorat, 23 km NWN of Bilo’l, 14–15.v.1977, Exped. Nat. Mus. Praha, n° 330.

Description: Body (Plate 10) 2.10–2.30 mm long. Eyes (0.16/0.16 mm) well developed, protruding, slightly bigger than temples. Maxillary palpi as in Figure 16, very big; second



Plates 5–8. 5: *Brachygluta martinae* Bückle, habitus; 6: *Trissemus vanharteni* nov. spec., habitus; 7: *Epicariss ventralis* Raffray, habitus; 8: *Ctenistes staudingeri* Schaufuss, habitus. Scale bars = 1 mm.

article curved, incrassate apically, with peduncle short prolonged by long penicillum (0.10 mm); articles 3 and 4 narrow, prolonged each by peduncle long (0.09 mm and 0.06 mm, respectively) bearing an even longer penicillum (0.17 mm and 0.16 mm, respectively). Legs very long and slender, terminated each by two very fine claws; prothrochanters 0.26 mm long and 0.07 mm wide; profemora 0.48 mm long and 0.10 mm wide; protibiae 0.60 mm long and 0.05 mm wide; protarsi combined 0.20 mm long and 0.02 mm wide; metatrochanters 0.28 mm long and 0.07 mm wide; metafemora 0.59 mm long and 0.12 mm wide; metatibiae 0.78 mm long and 0.03 mm wide; metatarsi combined 0.25 mm long and 0.02 mm wide.

Male. Antennae very long (1.45 mm) with club consisting of four articles. Lengths of antennomeres: 1: 0.11 mm; 2: 0.08 mm; 3–7 combined: 0.18 mm; 8: 0.33 mm; 9: 0.08 mm; 10: 0.28 mm; 11: 0.39 mm. Aedeagus as in Figure 15 (length 0.20–0.23 mm).

Female. Antennae very long (1.51 mm) with club consisting of three articles. Lengths of antennomeres: 1: 0.11 mm; 2: 0.08 mm; 3: 0.06 mm; 4: 0.08 mm; 5: 0.09 mm; 6: 0.10 mm; 7: 0.10 mm; 8: 0.11 mm; 9: 0.13 mm; 10: 0.26 mm; 11: 0.39 mm.

Comments: The new species shares in common with *Ctenisomorphus garamantica* an antennal club consisting of four articles in the male. These two species have, however, different antennal proportions, and their aedeagus is also diagnostic.

Ctenisomorphus major (Raffray, 1877)

Plate 9

Specimens examined: (60): Al-Ajban, 1♀, 6–22.v.2006, LT, AvH. Near Mahafiz, 3♂, 1♀, 23.iv.2005, at light and in light-trap, AvH & K. Szpila. Sharjah Desert Park, 1♂, 25.i–22.ii.2005; 1♀, 22.ii–9.iii.2005; 1♀, 21–29.iii.2005; 1♂, 3♀, 29.iii–6.iv.2005; 2♂, 1♀, 6–30.iv.2005; 4♂, 1♀, 30.iv–31.v.2005; 1♀, 30.vi–21.vii.2005; 2♂, 2♀, 20.x–8.xi.2005; 3♂, 13.xi–11.xii.2005; 1♂, 1♀, 1–25.ii.2006; 1♀, 17.ii–3.iii.2007; 1♂, 1♀, 20–30.iv.2007; 8♂, 20.x–24.xi.2007; 2♂, 2♀, 14.ii–1.iii.2008; all LT, AvH. Wadi Bih dam, 7♂, 1♀, 6–13.v.2007, LT, AvH. Wadi Madaq, 11♂, 1♀, 28.i.2006, in leaf litter, AvH; 2♂, 27.iv–5.v.2006, LT, AvH; 1♀, 24.ix–22.x.2006, WT, AvH; 3♂, 1–8.vi.2006, LT, AvH. 1♂, Wadi Wurayah farm, 15.i–22.ii.2009, LT, AvH.

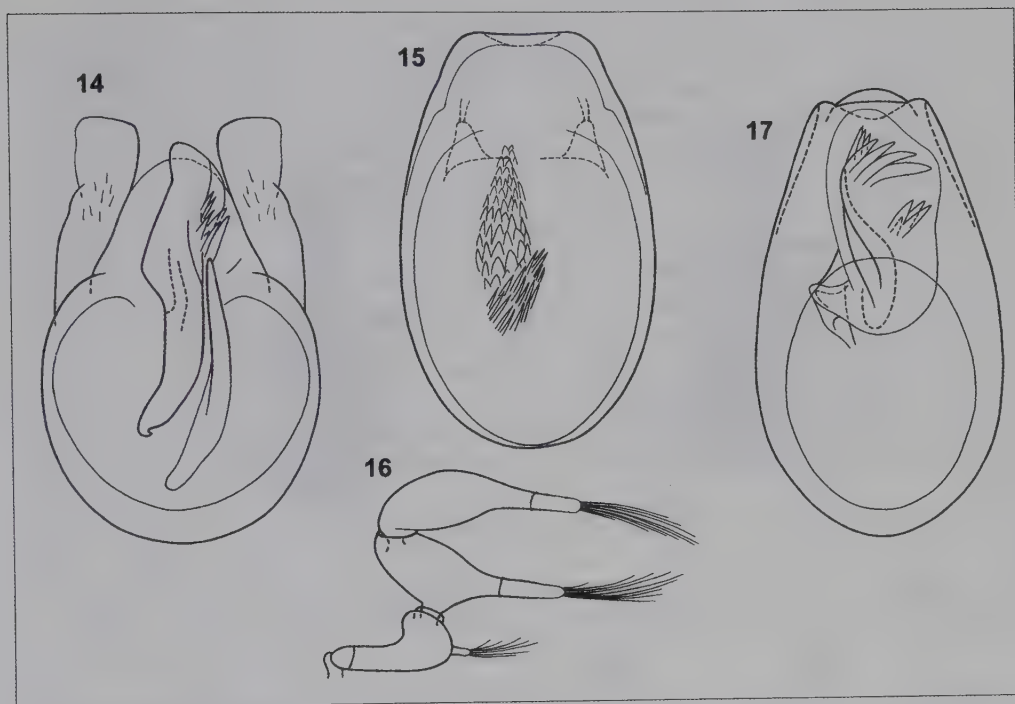
Comments: This species is known from Algeria, Tunisia, Egypt, Israel, Jordan, Turkey, Iran, Yemen and Saudi Arabia, and now also from the United Arab Emirates.

Genus *Enoptostomus* Schaum, 1864

Enoptostomus arabicus Besuchet & Cuccodoro **nov. spec.**

Plate 11, Figure 17

Specimens examined: Holotype: ♂ (MHNG): "UNITED ARAB EMIRATES, Wadi Madaq <25.18N; 56.07E> 27.04–05.05.2006, leg. A. van Harten, in light-trap, UAE 6509". Paratypes (225): 26♂, 4♀, same data as holotype. 1♂, al-Ajban, 2–9.iv.2006, MT, AvH. 2♂, Bithnah, 31.xii.2005–2.ii.2006, LT, AvH. 7♂, 1♀, Fujairah, 6.iv–2.v.2005, LT, AvH; 1♂, 20–27.v.2006, LT, AvH. 1♂, 1♀, Khor al-Khwair, 16–23.v.2007, LT, AvH. 10♂, 1♀, near Mahafiz, 21–28.viii.2006, LT, AvH. 1♂, Sharjah Desert Park, 1–25.ii.2006, LT, AvH; 1♂, 20.x–24.xi.2007, LT, AvH. 2♂, Sharjah-Khor Kalba, near tunnel, 7–22.iii.2006; 2♂, 24–30.v.2006; 5♂, 31.v–7.vi.2006; all LT, AvH. 1♂, NARC, near Sweihan, 14.iii–2.iv.2005, LT, AvH. 2♂, Wadi Bih dam, 1–8.iii.2007; 16♂, 1–15.iii.2007; 14♀, 24.iv–1.v.2007; 14♂, 30.v–5.vi.2007; all LT, AvH. 1♂, Wadi Madaq, 28.i.2006, in leaf litter, AvH; 2♂, 24.ix–22.vi.2006, WT, AvH; 5♂, 1–8.vii.2006, LT, AvH. 4♂, 2♀, Wadi Safad, 20.xii.2005–2.i.2006; 15♂, 2–26.i.2006; 1♀, 21.ii–4.iii.2006; 15♂, 31.i–21.ii.2006; 2♀, 15–22.iv.2006; 3♂, 17–24.vi.2006; 1♂, 1–8.vii.2006; all LT, AvH. 1♂, Wadi Siji, 24.ix–22.x.2006, WT, AvH. 3♂, Wadi Wurayah, 12–14.iv.2005, MT & WT, leg. T. Pape. 32♂, 2♀, Wadi Wurayah farm, 15.i–22.ii.2009; 2♂, 22.ii–2.iii.2009; 4♂, 1♀, 8–15.iii.2009; 12♂, 1♀, 15–30.iii.2009; all LT, AvH. OMAN: 3♂ (MHNG), Fanjah, Wadi Fanjah, 9.iv.1985, leg. C. Holzschuh.



Figures 14–17. 14: *Trissemus vanharteni* nov. spec., aedeagus in dorsal view. 15, 16: *Ctenisomorphus fortipalpis* nov. spec. 15: Aedeagus in dorsal view; 16: Maxillary palpus. 17: *Enoptostomus arabicus* nov. spec., aedeagus in dorsal view.

Description: Body as in Plate 11, 1.60–1.80 mm long (1.40–1.60 mm in *E. globulicornis*). Eyes protruding, with ommatidia rather big. Maxillary palpi with article 4 transverse and 0.22–0.25 mm long (0.19–0.21 mm in *E. globulicornis*), prolonged by penicillum 0.09–0.10 mm long (0.05–0.07 mm in *E. globulicornis*).

Male. Eyes 0.14–0.15 mm long (0.11–0.12 mm in *E. globulicornis*). Antennal club consisting of 4 articles and 0.46–0.49 mm long (0.36–0.39 mm in *E. globulicornis*). Metatibiae 0.55–0.60 mm long (0.47–0.52 mm in *E. globulicornis*). Aedeagus as in Figure 17 and 0.20–0.23 mm long (0.20–0.23 mm in *E. globulicornis*).

Female. Eyes 0.10–0.11 mm long (0.09–0.10 mm in *E. globulicornis*). Antennal club consisting of 3 articles and 0.31–0.34 mm long (0.24–0.26 mm in *E. globulicornis*).

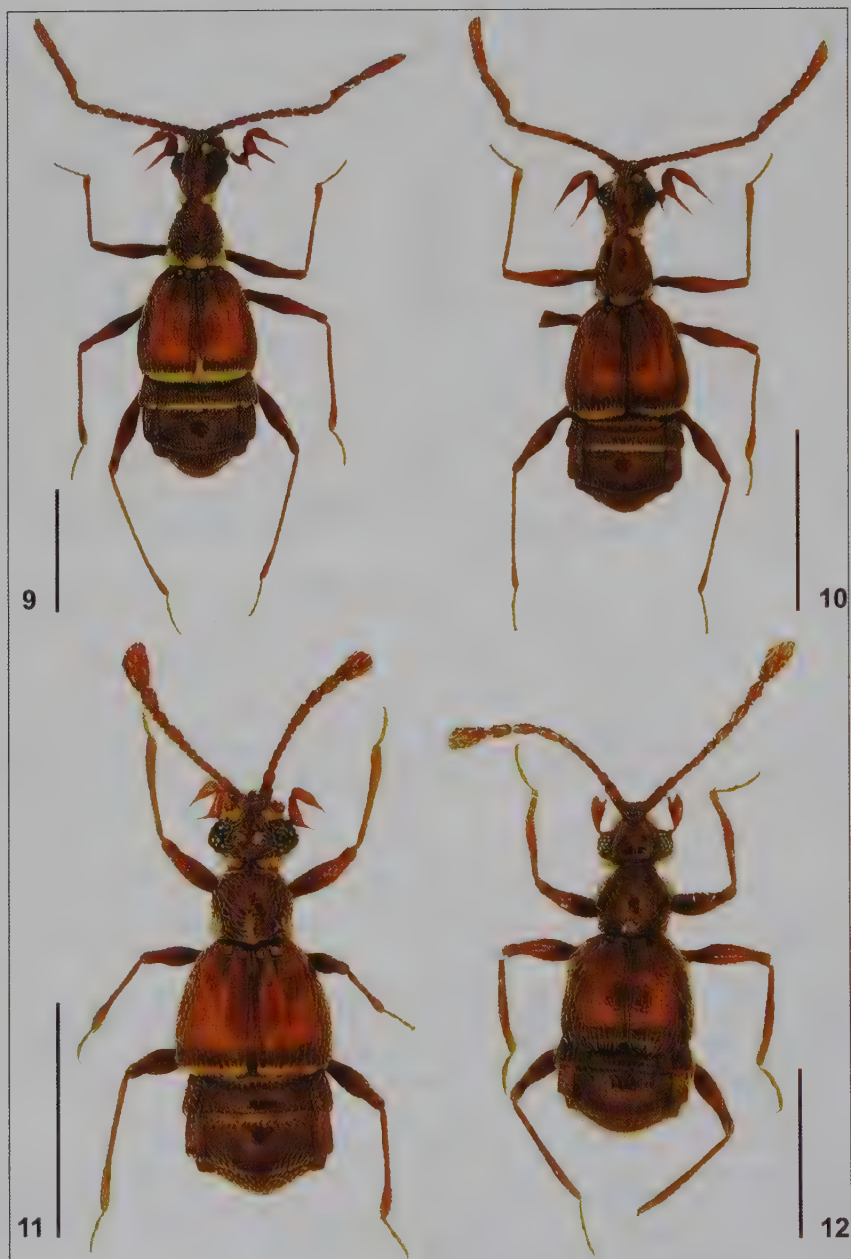
Comments: *Enoptostomus arabicus* strongly resembles *E. globulicornis* (Motschulsky, 1851), from which it differs essentially by having the maxillary palpi much more developed. The conformation of the aedeagus is also diagnostic.

Genus *Centrophthalmus* Schmidt-Göbel, 1838

Centrophthalmus persimilis Besuchet & Cuccodoro nov. spec.

Plate 12, Figures 18, 19

Specimens examined: Holotype: ♂ (MHNG): “UNITED ARAB EMIRATES, Wadi Safad <25.13N; 56.19E> 15–22.04.2006, leg. A. van Harten, in light-trap, UAE 8256”.



Plates 9–12. 9: *Ctenisomorphus major* (Raffray), habitus; 10: *Ctenisomorphus fortipalpis* nov. spec., habitus; 11: *Enoptostomus arabicus* nov. spec., habitus; 12: *Centrophtalmus persimilis* nov. spec., habitus. Scale bars = 1 mm.

Description: Body (Plate 12) 2.15 mm long, uniformly pale reddish-brown, rather uniformly covered on entire dorsum with moderately long pubescence becoming slightly longer laterally on elytra and abdomen. Head (length 0.37 mm; width 0.45 mm) with three deep fovae of similar dimensions, the medial one in the sulcus of the frontal lobe. Temples very short (0.04 mm) and angled, bearing a spur. Eyes well developed, protruding, margined posteriorly by numerous long erect setae. Maxillary palpi with article 3 (0.09 mm wide) lacking dorsal depression, and article 4 very slender (length 0.12 mm; width 0.04 mm). Antennae (length 1.30 mm) less robust than *C. tempestivus*, with club consisting of four elongated articles (8–11); proportions (length/width, in mm): scapus 0.19/0.06 – pedicel 0.08/0.07 – article 3 0.07/0.05 – article 4 0.05/0.05 – article 5 0.05/0.05 – article 6 0.06/0.05 – article 7 0.07/0.05 – article 8 0.16/0.06 – article 9 0.15/0.07 – article 10 0.15/0.08 – article 11 0.27/0.14. Pronotum (length 0.39 mm; width 0.42 mm) bearing three deep mediobasal fovae. Abdomen with first visible tergite (length 0.15 mm) bearing two diverging carinulae extending on entire tergal length, and second visible tergite (length 0.31 mm) bearing posteriorly two parallel carinulae extending on slightly less than half of tergal length. Protibiae not bent subapically.

Male: Aedeagus as in Figures 18 and 19 (length 0.34–0.12 mm) gracile, rather simple.

Female: Unknown.

Comments: *Centrophthalmus persimilis* is very similar to *C. abyssinicus* Raffray, 1904, from Yemen, from which it can be distinguished only by the structure of the aedeagus, notably by the shape of the internal sac.

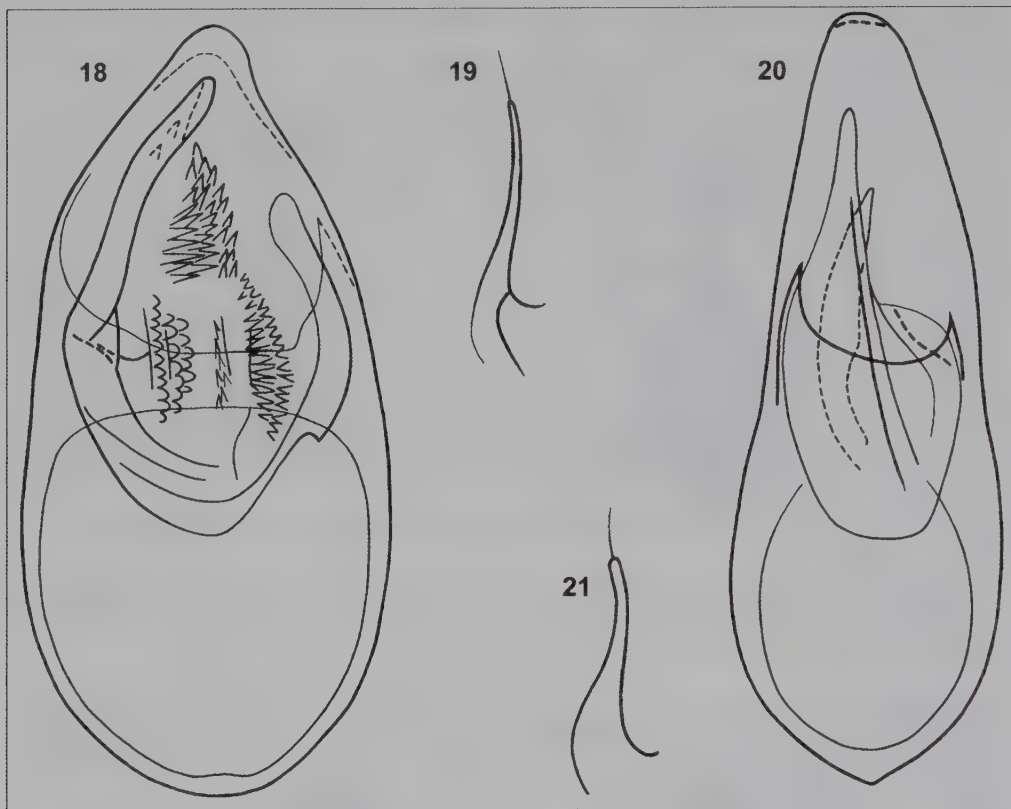
***Centrophthalmus tempestivus* Besuchet & Cuccodoro nov. spec.** Plate 13, Figures 20, 21
Specimens examined: Holotype; ♂ (MHNG): “UNITED ARAB EMIRATES, Wadi Safad <25.13N; 56.19E> 31.01–21.02.2006, leg. A. van Harten, in light-trap, UAE 5923”. Paratype (1): 1♂ (MHNG), same data as holotype but 15–22.iv.2006.

Description: Body (Plate 13) 2.50 mm long, uniformly pale reddish-brown, rather uniformly covered on entire dorsum with moderately long pubescence. Head (length 0.44 mm; width 0.49 mm) with three deep fovae of similar dimensions, the medial one in the sulcus of the frontal lobe. Temples short (0.05 mm) and angled, without spurs. Eyes well developed, protruding, margined anteriorly and posteriorly by numerous long erect setae. Maxillary palpi with article 3 (0.10 mm wide) lacking dorsal depression, and article 4 very slender (length 0.14 mm; width 0.04 mm). Antennae (length 1.31 mm) robust, with club consisting of four ovoid articles (8–11); proportions (length/width, in mm): scapus 0.20/0.08 – pedicel 0.09/0.07 – article 3 0.08/0.06 – article 4 0.07/0.06 – article 5 0.06/0.06 – article 6 0.06/0.06 – article 7 0.06/0.06 – article 8 0.12/0.08 – article 9 0.15/0.09 – article 10 0.15/0.11 – article 11 0.26/0.15. Pronotum (length 0.41 mm; width 0.48 mm) bearing three deep mediobasal fovae. Abdomen with first visible tergite (length 0.18 mm) bearing posteriorly two diverging carinulae extending on slightly more than half tergal length, and second visible tergite (length 0.38 mm) bearing posteriorly two parallel carinulae extending on slightly less than half of tergal length. Protibiae bent subapically.

Male: Aedeagus as in Figures 20 and 21 (length 0.51–0.25 mm), robust, quite complex.

Female: Unknown.

Comments: *Centrophthalmus tempestivus* is very similar to *C. sharpi* Besuchet, 1966, and *C. mesopotamensis* Besuchet, 1966, both from Mesopotamia (Besuchet, 1966: 59–65, Figs 1 and 4), from which it differs notably by the shape of the aedeagus.



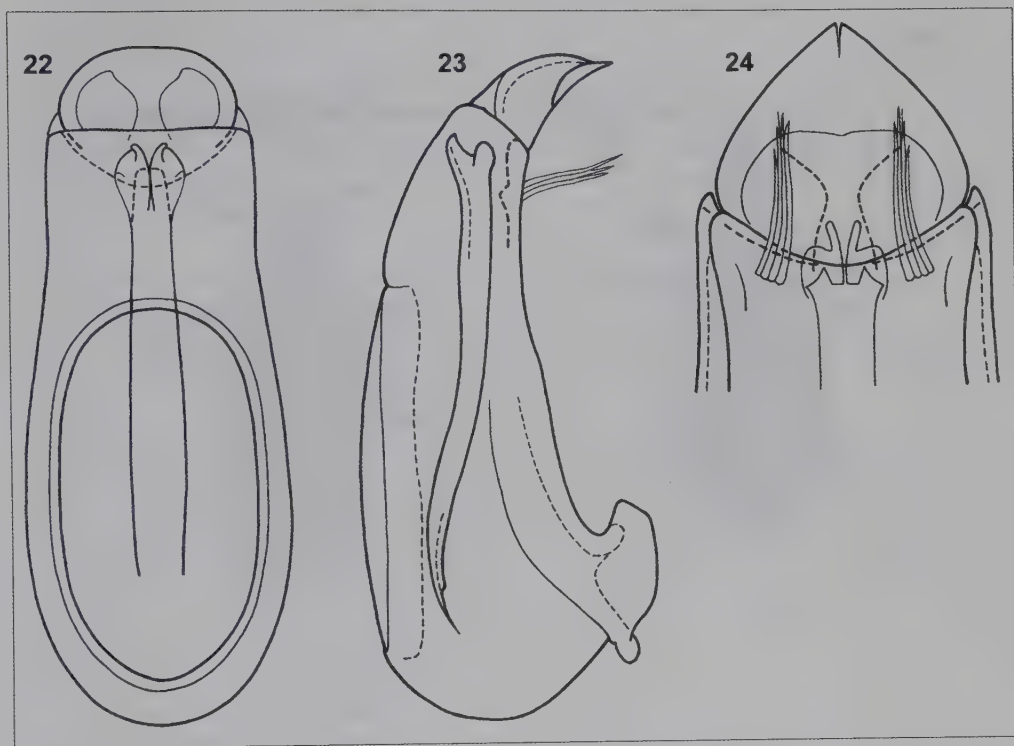
Figures 18–21. 18, 19: *Centrophthalmus tempestivus* nov. spec. 18: Aedeagus in dorsal view; 19: Paramere (same magnification as 18). 20, 21: *Centrophthalmus persimilis* nov. spec. 20: Aedeagus in dorsal view; 21: Paramere (same magnification as 20).

Tribe **Clavigerini** Leach, 1815

Genus *Commatocerus* Raffray, 1882

Commatocerus are true myrmecophiles, with three segmented antennae and atrophic mouthparts. This genus erected by Raffray (1882) was synonymised by himself some years later with *Fustiger* Leconte, 1886 (Raffray 1890), and subsequently revalidated again by Raffray (1893). Although it was even revalidated a second time by Jeannel (1949), the latter nomenclatural act has been overlooked in the catalogues of Newton and Chandler (1989) and Löbl and Besuchet (2004), in which both genera stand as synonyms.

The finding of a member of this genus in the United Arab Emirates is very interesting, as it contained so far only three African species: *C. elegantulus* Raffray, 1882, from Ethiopia (Abyssinia), *C. leleupi* Jeannel, 1953, from Zaire (Kivu) and *C. aspericornis* Jeannel, 1956, from Zaire (Oriental).



Figures 22–24. *Commatocerus concinnus* nov. spec. 22: Aedeagus in dorsal view; 23: Aedeagus in lateral view; 24: Aedeagus in ventral view.

***Commatocerus concinnus* Besuchet & Cuccodoro nov. spec.**

Plate 14, Figures 22–24

Specimens examined: Holotype: ♂ (MHNG): "UNITED ARAB EMIRATES, Wadi Shawkah <27.08N; 56.01E> 03–18.02.2008, leg. A. van Harten, in water-trap, UAE 8741".

Description: Body (Plate 14) 2.40 mm long, uniformly pale reddish-brown, with dorsal pubescence rather short and longer on elytra and abdomen than on head and pronotum. Head (length 0.50 mm; width 0.27 mm) shagrinated dorsally and laterally, with anterior portion rather cylindrical and posterior portion flattened, the latter dorsally concave; pair of interocular fovae deep and of similar dimensions, closer to the eyes than to neck. Temples (0.20 mm) slightly widened posteriorly, abruptly narrowed behind to distinct neck. Eyes (0.08/0.09 mm) located laterally on the middle of the head capsule, consisting of small ommatidia. Antennae consisting of three articles, the two basal short (combined length 0.13 mm), and the terminal very long (length 0.73 mm), cylindrical, apically truncate, and bearing numerous setae. Pronotum (length 0.33 mm; width 0.38 mm) nearly cylindrical, bearing three small mediobasal fovae. Elytra (length 0.72 mm; combined width 0.76 mm) each with a sutural stria entire and four minute basal fovae. Abdomen (length 0.95 mm; width 0.83 mm) particularly long, consisting only of one tergite visible in dorsal view prolonged by two vertical tergites; first visible tergite with anterior third smooth, glabrous, with deep and



Plates 13–14. 13: *Centrophtalmus tempestivus* nov. spec., habitus; 14: *Commatocerus concinnus* nov. spec., habitus. Scale bars = 1 mm.

broad depression gradually raised posteriorly, and posterior two-thirds evenly convex and covered with long setae; pleurites 1 each bearing anteriorly small tufted trichomes (0.11 mm). Abdomen consisting ventrally of 6 ventrites: first short, pubescent; second quite long; third and fourth shorter than second, corresponding to the long tergite; fifth and sixth ventrites corresponding to the two apical tergites.

Male: Metaventricle very convex, bearing slightly behind middle a small projecting tooth. Mesofemora bearing basally a stout tooth (length 0.05 mm). Mesotibiae (0.61 mm) with basal portion slender and apical half stout, bearing on apical third a pair of small contiguous adventral teeth. Aedeagus as in Figures 22–24 (length 0.49–0.19 mm) with parameres bearing each a subapical tuft of setae.

Comments: *Commatocerus concinnus* is the only member of the genus having the terminal antennomeres cylindrical, instead of apically enlarged.

ACKNOWLEDGEMENTS

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Authors' addresses:

Dr. C. Besuchet, Muséum d'histoire naturelle, C. P. 6434, CH-1211 Geneva 6, Switzerland:
e-mail: betty.ott@bluewin.ch

Dr. G. Cuccodoro, Muséum d'histoire naturelle, C. P. 6434, CH-1211 Geneva 6, Switzerland:
e-mail: giulio.cuccodoro@ville-ge.ch

Order Coleoptera, Family Buprestidae

Svatopluk Bílý, Vítězslav Kubáň,
Mark G. Volkovitsh and Mark Yu. Kalashian

INTRODUCTION

In surveying the Buprestid fauna of the UAE, altogether 41 species of the family Buprestidae are recorded from this country, 20 of which are new records. All species are illustrated and 10 new species are described and compared with their most closely related species: *Acmaeodera* (*Acmaeotethya*) *vanharteni* Volkovitsh nov. spec., *A. (A.) batelkai* Volkovitsh nov. spec., *A. (Cobosiella) holynskii* Volkovitsh nov. spec., *Xantheremia* (*Xantheremia*) *prepsli* Volkovitsh nov. spec., *Acmaeoderella* (*Omphalothorax*) *argentea* Volkovitsh nov. spec., *A. (Acmaeoderella) pseudonivetecta* Volkovitsh nov. spec., *Sphenoptera* (*Tropeopeltis*) *vanharteni* Kalashian nov. spec., *S. (Hoplistura) gnezdilovi* Kalashian nov. spec., *S. (Chrysoblemma) mirabilis* Kalashian nov. spec. and *S. (Deudora) schmideggeri* Kalashian nov. spec.

The beetle family Buprestidae (jewel beetles) comprises about 15000 species and has a world-wide distribution (Bellamy, 2008). Most of the species are distributed in the humid tropics and semidesert areas of the planet. They are usually xylophagous species developing under the bark or in the sapwood of trees and shrubs, but a large number of species (tribe Trachyini) are leaf-miners developing in the leaf parenchyme of various plants including grasses and ferns. A small part of species (subfamily Julodinae) develops in the soil and their larvae feed on roots of grasses and shrubs.

The following papers on the Buprestid fauna have been published from the countries of the Arabian Peninsula and adjacent countries: SAUDI ARABIA (Blair, 1931 [southern part: great desert Rub'al Khali]; Shalaby, 1961; Beccari, 1971; Bílý, 1979, 1980, 1982, 1985, 1990; Walker & Pittaway, 1987); OMAN (Janikova, [no date]); YEMEN (Curletti & van Harten, 2002, 2004; Bílý et al., 2003; Brechtel, 1998, 2000); and of the adjacent areas: IRAQ [and former Mesopotamia] (Holdhaus, 1920; Knopf, 1971; Cobos, 1972); SINAI, ISRAEL, JORDAN, PALESTINE (Sahlberg, 1913; Andres, 1920; Obenberger, 1946; Katbeh-Bader, 1996; Niehuis, 1989, 1996; Chikatunov et al., 1999; Volkovitsh et al., 2000; Halperin & Argaman, 2000; Chikatunov, 2003; Volkovitsh, 2004); LEBANON, SYRIA (Niehuis, 1989; Levey, 2006); IRAN (Théry, 1925a,b; Salavatian, 1950; Mandl & Pochon, 1957; Adeli, 1972; Radjabi, 1974; Bílý, 1983; Abai, 1984; Modarres Awal, 1997; Borumand, 2002); EGYPT (Walker, 1871; Kerremans, 1908; Théry, 1929b, 1930b, 1935, 1936a, 1938; Lotte, 1943; Alfieri, 1976; Fadl et al., 1991, 1992a,b); SUDAN (Théry, 1910; Bílý, 1971, 1973); ERITREA (Gestro, 1889; Kerremans, 1907a; Obenberger, 1939); DJIBOUTI [and former Obock] (Fairmaire, 1892; Abeille de Perrin, 1907) and SOMALIA (Kerremans, 1896, 1909).

The Buprestid fauna of the UAE is, however, little known. There are only three papers dealing with jewel beetles of the UAE: Gillett & Gillett (2005) recorded 18 species, Howarth & Gillett (2008) recorded 19 species and Howarth & Gillett (2009) recorded 22 species. Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009) recorded 4 species of the genus *Julodis* Eschscholtz, 1829, for the territory of the UAE without specification of subspecies and without concrete faunistic data. Their lists were evidently based on the incorrect determinations of some specimens and a simple acceptance of these data is not advisable. The genus *Julodis* has not been revised since 1934 (Obenberger, 1934b); only Kubáň (2006) and

Kubáň & Volkovitsh (2006) published the modern catalogue with comments on the Palaearctic species. Species of the genus *Julodis* from the central Sahara, Sahel and from the Arabian Peninsula have not yet been comprehensively treated. The distribution of these species (namely *J. cailliaudi* (Latreille, 1827) and *J. fimbriata* (Klug, 1829)) in Bellamy (2008) is incomplete and partly incorrect. In the present paper the distribution of all taxa of the genus *Julodis* recorded by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009) is presented by V. Kubáň in the scope of their complex distribution. Based on the specimens studied and on the data from the literature all mentioned species of the genus *Julodis* are treated on the subspecific level with updated distribution and with their actual or supposed distribution in the UAE, so in some cases it was necessary to add a short taxonomic paragraph (catalogue) under the headline of certain species.

Due to the analogous situation with taxa recorded by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009), it was also necessary to solve problems and comment upon them in the tribe Acmaeoderini (M.G. Volkovitsh), Polycestini (V. Kubáň and M.G. Volkovitsh) and in the genus *Lampetis* Dejean, 1833 (V. Kubáň). A modern taxonomic study of the genus *Lampetis* has not been published, so all species recorded by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009) for the UAE are treated in the present study accordingly to the catalogues of Kubáň (2006) and Bellamy (2008), together with all accessible information on their distribution.

The genus *Trachys* Fabricius, 1801 is treated (V. Kubáň) according to the Obenberger's collection (NMPC), original descriptions and photogallery of the types deposited in BMNH, HNHM, MNHN, NHMB, NMPC, ZIN (gathered in the electronic form in NMPC and in the files of E. Jendek, Canadian Food Inspection Agency, Ottawa). Also, all other taxa recorded from the UAE were treated in the same way.

If not stated otherwise, the distribution of the treated species follows that given by Kubáň et al. (2006), Löbl & Smetana (2007) and Bellamy (2008, 2009).

MATERIALS AND METHODS

Most of the specimens examined was collected by A. van Harten by means of light traps, water traps and Malaise traps in the course of the last decade and preserved in alcohol. Only a small part was collected by sweeping and individual collecting by other collectors. Small specimens were mounted on cards together with extracted genitalia, large specimens were pinned. Macrosides of genitalia (Acmaeoderini) are kept separately from the beetles in the ZIN collection. If not stated otherwise the colour images were taken by V. Kubáň.

Family-group names of the taxa are given in the systematic order following the most recent system of the family Buprestidae by Bellamy (2003, 2008, 2009). Genus-group names of the taxa in Acmaeoderini (by M.G. Volkovitsh) and Spenopterini (by M.Yu. Kalashian) are given in the systematic order.

Information in ["brackets"] following the type locality indicates the original spelling differs from the present accepted spelling.

The deposition of the type specimens (holotypes and paratypes) is mentioned in the descriptions of the relevant new species, non-type specimens are deposited (if not stated otherwise) in NMPC, UAEIC and ZIN.

The following codens are used in the text: BMNH = The Natural History Museum, London, United Kingdom; DBCR = D. Baiocchi collection, Rome, Italy; EACA = Environment Agency collection, Abu Dhabi, UAE; CCIT = G. Curletti collection, Carmagnola, Italy; GMCC = G. Magnani collection, Cesena, Italy; GNCW = G. Novak collection, Wien, Austria; HMCM = H. Mühle collection, München, Germany; HNHM = Hungarian Natural

History Museum, Budapest, Hungary; JBCP = J. Batelka collection, Praha, Czech Republic; MGCR = M. Gigli collection, Rome, Italy; MJCP = M. Johanides collection, Praha, Czech Republic; MKCY = M. Kalashian collection, Yerevan, Armenia; MMUE = Manchester Museum, University of Manchester, Manchester, United Kingdom; MNCA = M. Niehuis collection, Albersweiler, Germany; MNHN = Muséum national d'Histoire Naturelle, Paris, France; MNMS = Museo Nacional de Ciencias Naturales, Madrid, Spain; MSCB = M. Snížek collection, České Budějovice, Czech Republic; MSCZ = M. Škorpík collection, Znojmo, Czech Republic; MSNM = Museo Civico di Storia Naturale di Milano, Italy; MZHF = Zoological Museum, University of Helsinki, Helsinki, Finland; NMPC = National Museum, Praha, Czech Republic; PKCP = P. Kabátek collection, Praha, Czech Republic; RHCM = R. Hołyński collection, Milanówek, Poland; SECB = C. Schmid-Egger collection, Berlin, Germany; SPCV = S. Prepsl collection, Vyškov, Czech Republic; TCMC = T. MacRae collection, Chesterfield, U.S.A.; VKCB = V. Kubáň collection, Brno, Czech Republic; UAEIC = UAE Invertebrate Collection, UAE; VKCZ = V. Kabourek collection, Zlín, Czech Republic; ZIN = Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia; ZMHB = Museum für Naturkunde, Berlin, Germany.

SYSTEMATIC ACCOUNT

In the following list all 41 species representing 5 subfamilies known from the territory of the UAE are recorded, including all data available for each species. In addition, all records of the previous authors are commented upon.

Subfamily **Julodinae** Lacordaire, 1857

Genus **Julodis** Eschscholtz, 1829

Julodis cailliaudi cailliaudi (Latreille, 1827)

Plate 1

Buprestis cailliaudi Latreille, 1827: 277. Type locality: Northern Sudan: Dongola ["Dongolah"].

Julodis aethiopica Laporte, 1835: 162. Type locality: Southern Egypt and northern Sudan: Nubia ["Nubie"]. Synonymy by Kerremans (1892).

Julodis cailliaudi var. *caynura* Kerremans, 1914: 244 (*cailliaudi* [sic!]; available name, established as a subspecific name). Type locality: Northern Cameroon or Northern Nigeria, Bornu Region ["Bornou"]. Synonymy by Théry (1930b).

Julodis obscura Bílý, 1971: 174, figs. 1, 2, 4. Type locality: Northeastern Sudan maritime: Port Sudan ["Sudan, Red Sea Coast, Port Sudan"]. Synonymy by Kubáň (2006).

Julodis cailliaudi cailliaudi: Kubáň & Volkovitsh, 2006: 327 (palearctic catalogue; synonymy); Bellamy, 2008: 54 (*cailliaudi* [sic!], world catalogue).

Specimens examined: ALGERIA: "Algerie 1881 C. Starck" (1 ex., ZIN). "Alzhir" (2 ex., ZIN in coll. V.N. Stepanov). Northern CAMEROON or northern NIGERIA: Mayo Kebbi and Bénoué rivers, 1904, Capt. Lenfant leg. (1 ex., MNHN). Bornu Region: "Bornou" [see also Kerremans, 1907b], A. Schultze leg. (2 ♂, syntypes of *Julodis cailliaudi* var. *cyanura*, MNHN); "Bornou" (3 ex., NMPC); "Mupara (Bornu)", 9.i.1904 (1 ex., NMPC). CENTRAL AFRICAN REPUBLIC and northern DEMOCRATIC REPUBLIC OF THE CONGO: Ubangi river banks, 1912, I. Bonnaure leg. (2 ex., MNHN). EGYPT: "Aegypte" (1 ex., MNHN in coll. Oberthür). "Aegyptus" (6 ex., NMPC; 2 ex., ZIN). "Egypt sup[er]ior = upper]." (4 ex., NMPC). Luxor (1 ex., ZIN). Luxor–Thebes, A.N. Semenov leg. (2 ex., ZIN). ERITREA: "Erythrea", iii.1933, B. Machulka leg. (3 ex., NMPC). Asmara (1 ex., NMPC; 4 ex., ZIN in coll. V.N. Stepanov). Mai Aualid [N16°04' E38°51'], 1871, O. Antinori leg. (1 ♂, MNHN in coll. Oberthür). ETHIOPIA: "Abyssinie Voy. 1881", A. Raffray leg. (1 ♂, MNHN in coll. Oberthür). Ghedi Calé, 201 km by railway to Addis Ababa, N10°16'20" E42°10'20", 710 m, Dr. Martin leg. ["Djibouti Dr. Martin, Ch. de fer du Harrar, Kilom. 201"] (1 ♀, NMPC). GAMBIA and SENEGAL: "Senegambia"

(1 ex., MNHN in coll. Oberthür). MALI: Hombori (2 km N), N15°17'49.96" W01°41'55.15", 290 m, 7.xii.2006, dead specimen, M. Škorpić leg. (1 ex., MSCZ). Tombouctou, G. Vuillet leg. (1 ex., MNHN in coll. Oberthür). NIGER: Aïr Mts., Massif de Taroudji, 900 m, 8–12.ix.1947, L. Chopard & A. Villiers leg. (1♂, NMPC). Northern NIGERIA: Katsina, xii.1936, S. Škulina leg. (13 ex., NMPC). Lake Chad, S. Škulina leg. (1 ex., NMPC). SENEGAL: (2♂, 1♀, MNHN in coll. Oberthür; 1♂, ZIN). SUDAN: "Sudan" (1 ex., NMPC). "Sudan aegypt." (17 ex., NMPC); near Debeira, 6–13.x.1962, R. Linnavuori leg. (1♀, NMPC). Dongola (1 ex., MNHN in coll. Oberthür; 2 ex., NMPC; 1 ex., ZIN). Juba, iii.1980 (2 ex., VKCB; 2 ex., ZIN). Khartoum: Skála leg. (1♂, NMPC); 2.xi.1959, on *Acacia arabica* flowers, D.M. Steinberg leg. (3 ex., ZIN); 19.xi–29.xii.1972, V. Seichert leg. (2 ex., MSCZ, NMPC); viii.1973, K. Rataj leg. (1♀, VKCB); 5.xi–29.xii.1973, V. Seichert leg. (11 ex., MSCZ, NMPC, VKCB); 14.xii.1974, V. Seichert leg. (1 ex., MSCZ); 20.x.1974, J. Moravec leg. (1♂, VKCB). Khartoum–Tutti Insel, 17.xii.1973, V. Seichert leg. (1 ex., NMPC). Kurdufan (1 ex., ZIN); Port Sudan, Red Sea coast, 6.xii.1965, P. Štys leg. (♀, holotype of *J. obscura*, NMPC). Nubia (1 ex., MNHN in coll. Oberthür; 4 ex., NMPC; 3 ex., ZIN). "Nubie" (1♂, syntype of *J. aethiopica*, MNHN in coll. Oberthür) (Plate 1). Wad Madani ["Uzd-medani"], 9.xi.1959, at light, D.M. Steinberg leg. (1 ex., ZIN).

Important published records: Mali, Tombouctou, 28.ix.1909, on *Balanites aegyptiaca* and on *Combretum aculeatum* (Théry, 1930b). Mauritania, near Oualata, Konou (Théry, 1934).

Remarks: Distribution of *J. c. cailliaudi* in Tunis (Bílý, 1971) and Libya (Bílý, 1971, 1973) is uncertain; neither specimens nor references have been found from these countries. Also the record from Algeria (Biskra: Lucas (1859); specimens from ZIN) is questionable; these specimens were most probably collected in the southern part of Algeria.

The northern border of the distribution goes across central Chad and southern Egypt (northernly to Luxor), southern border nearly reaches the equator (Ubangi river) and southern Sudan (Juba). Osculati (1844) recorded this species from "Persia m." – it is necessary to check this isolated record.

Howarth & Gillett (2008, 2009) recorded "*Julodis cailliaudi* [sic!]" as a new species for the fauna of UAE but we have not studied their specimens; the occurrence of the nominotypic subspecies (*J. c. cailliaudi*) in the Arabian Peninsula is impossible. Also the subspecies *J. c. mniszecii* Reiche in Thomson, 1860, has not been recorded from Arabian Peninsula so far. This subspecies is distributed in the coastal areas of Eritrea, Djibouti and northern Somalia together with *J. fimbriata lacunosa* Fairmaire, 1882, which has been recently recorded from Oman (see below); the occurrence of *J. c. mniszecii* in the southeastern portion of the Arabian Peninsula is not out of the question.

The record of "*Julodis cailliaudi* [sic!]" in Saudi Arabia (Bílý, 1985) concerned *J. candida* Hołyński, 1996 (see also Hołyński, 1996, and Howarth & Gillett, 2009); also in the case of Howarth & Gillett (2008, 2009) the record concerned is most probably *J. candida*.

The distribution of *J. c. cailliaudi* in Bellamy (2008) is incomplete and it does not include the published data, so we present herewith the new, complete distribution of this subspecies.

Host plant: Larval development outside plant roots in the soil.

Distribution: ?Algeria (Lucas, 1859; new record), Cameroon (new record), Central African Republic (new record), Chad (Descarpentries & Bruneau de Miré, 1963; Descarpentries & Mateu, 1965), northern Democratic Republic of the Congo (new record), Egypt (Laporte & Gory, 1835; Kerremans, 1908; Lotte, 1943), Eritrea (Obenberger, 1939), Ethiopia (new record), Gambia (Bellamy, 2008; new record), ?southern Iran (Osculati, 1844; Jakobson, 1913), ?Libya (Bílý, 1971, 1973), Mali (Théry, 1930b; new record), Mauritania (Théry, 1934), Niger (Obenberger, 1950; new record), northern Nigeria (new record), Senegal (Kerremans, 1905 [Casamance river]; Descarpentries, 1976), Sudan (Latreille, 1827 [type locality]; Bílý, 1971, 1973), ?Tunis (Bílý, 1971).

***Julodis cailliaudi mniszechii* Reiche in Thomson, 1860 stat. restit.**

Plates 2–3

Julodis Mniszechii Reiche in Thomson, 1860: 24. Type locality: Ethiopia [“Abyssinie”]. – Bellamy, 2008: 54 (“*mniszechii* Thomson”; world catalogue; synonym of *cailliaudi cailliaudi*). Synonymy by Théry (1930b).

Julodis cailliaudi var. *berberae* Abeille de Perrin, 1900: 4 (available name, established as a subspecific name). Type locality: Coast of the northwestern Somalia: Berbera. – Bellamy, 2008: 54 (world catalogue; erroneously as species name; synonym of *cailliaudi cailliaudi*). Synonymy by Théry (1930b).

Julodis cailliaudi var. *Blairi* Théry, 1930b: 16 (unavailable name; infrasubspecific taxon; “Abyssinie”). – Bellamy, 2008: 54 (world catalogue; as available name and new synonym of *cailliaudi cailliaudi*).

– *Julodis cailliaudi* [sic!] var. *lacunosa* Fairm.” *sensu* Obenberger, 1934a: 51 (not Fairmaire, 1882; new locality in Somalia).

Specimens examined: DJIBOUTI: “Djibuti Afr. or.” [or Ethiopia] (3 ex., ZIN in coll. V.N. Stepanov). “Djibutti” [or Ethiopia] (1 ex., NMPC). Obock: [“Obock V.M. Duchon”] (1 ex., ZIN); [“Obok N. M. 92”] (1 ex., ZIN); [“Obock 1890 (ex Aubert)”] (1 ex., NMPC); Red Sea coast [“Obocht Rot. Meer”] (1 ex., NMPC); [“Abyssinie Obock Coll. Schramm”] (1 ex., NMPC); [“Coll. Meyer-Darcis Obock”] (2 ex., NMPC). DJIBOUTI and SOMALIA: “Djibuti Somali” (12 ex., NMPC). EGYPT: “Aegyptus” (4 ex., NMPC); “Egypte” (1 ex., ZIN). Southeastern EGYPT or northeasten SUDAN: Nubia: “Nubien” (4 ex., NMPC). ERITREA: “Erythrea” (6 ex., NMPC). Arafali (1 ex., NMPC). ETHIOPIA: [without locality label] (1♂, syntype of *Julodis mniszechii*, 32 mm, NMPC) (Plate 2). “Mniszechii Reiche Kordofan Type” (1♀, ?syntype of *J. mniszechii*, 36 mm, MNHN). “Abyssinia” (3 ex., ZIN). Somali Province: “S. & SE. Abyssinia.”, 1909, R.E. Drake-Brockman leg. (1♂, “type” of *J. cailliaudi* var. *blairi*, 24 mm, MNHN). Jaldessa [“Djildessa–Djibuti, Galla + Obock”] N09°43'20" E42°07', 1090 m, Dmitriev leg. (2 ex., ZIN). “Djibouti kil[omètre] 110 Daouannlé Dr. Martin” [probably railway km 110: Ferate (7 km NE), N10°54' E42°38'20", 720 m, wadi with *Acacia* trees] (1 ex., NMPC). SOMALIA: Berbera: [“Berberah”], A.A. Argod-Vallon leg. (1♀, syntype of *J. c.* var. *berberae*, MNHN) (Plate 3); (8 ex., NMPC). “Berbera Chech” (5 ex., NMPC).

Important published records: Northeastern SOMALIA: Bari Province: Monti Carcar [N09°55' E19°23'18"], viii.1931, G. Scortecci leg. (MSNM) (Obenberger, 1934a, as “*J. cailliaudi* [sic!] var. *lacunosa*”).

Remarks: Described as a species from Ethiopia (“Abyssinie”). Precise locality data and the number of the type specimens unknown. The authorship was erroneously attributed to J. Thomson with the type locality “Sudan”. The specimen designated as the “type” from “Kordofan” in the collection of Oberthür (MNHN) does not correspond with the original description; on the contrary the specimen in the Obenberger’s collection (NMPC) fully corresponds with the description incl. the size and it is supposedly one of the syntypes of *Julodis mniszechii*. The specimens treated above (namely these from Eritrea, Djibouti and Somalia) strongly differ from the nominotypic subspecies distributed in the whole Sahel; transitional forms between *J. cailliaudi cailliaudi* and *J. c. mniszechii* can be found in the eastern parts of Nubia and Ethiopia. The occurrence of *J. c. mniszechii* in the southeastern portion of the Arabian Peninsula is not out of the question.

Host plant: Larval development outside plant roots in the soil.

Distribution (new): Djibouti, southeastern Egypt, Eritrea, Ethiopia, northern Somalia, northeastern Sudan.

***Julodis cailliaudi spectabilis* Gory, 1840**

Plate 4

Julodis spectabilis Gory, 1840: 23, pl. 4, fig. 21. Type locality: Saudi Arabia, Jiddah [“Djeidda”].

Julodis cailliaudi spectabilis: Kubán & Volkovitsh, 2006: 327 (palaeartic catalogue); Bellamy, 2008: 54 (*cailliaudi* [sic!], world catalogue).

Specimens examined: [without locality data] (2 ex., NMPC) (Plate 4). “Algerie 1881 C. Starck” (1 ex., ZIN; incorrect locality). ARABIA (Red Sea coast of Saudi Arabia or Yemen): “Arabie” (1♂, MNHN in coll. Oberthür). “Arabia” (1 ex., VKCB; 3 ex., ZIN). SAUDI ARABIA: “Arabie” (5♂, syntypes of *Julodis spectabilis*, MNHN in coll. Oberthür). YEMEN: Tihamah coastal region: “Plaine de Tihamah”

(1 ex., MGCR). Ta'izz Governorate, N of Mocha by road, N13°23'37" E43°16'22", 5 m, 28.x.2007, dead specimens, A. Reiter leg. (2 ex., MSCZ).

Important published records: Southwestern Yemen: Tihamah coastal region: Mocha ("Moka") (Kerremans, 1905); Yemen, 10.xii.1956, M.H. Housny leg. (Shalaby, 1961)

Remarks: Poorly known subspecies from the western Arabian Peninsula (Kubáň & Volkovitsh, 2006) known only from a few specimens. Some authors (Kerremans, 1905; Théry, 1930b and Obenberger, 1926) interpreted it together with *Julodis cailliaudi mniszechii* as a variability of the nominotypic form. Also the occurrence of this subspecies in UAE is impossible.

Host plant: Larval development outside plant roots in the soil.

Distribution: Southwestern Arabian Peninsula, Tihamah coastal region of the Red Sea in Saudi Arabia and Yemen.

Julodis candida Hołyński, 1996

Plates 78–79

Julodis cailliaudi [sic!]: Bílý, 1985: 160 (list; Saudi Arabia).

Julodis (Julodis) candida Hołyński, 1996: 135. Type locality: Saudi Arabia, Eastern Province, 21 km N of Ain Dar, N26°11' E49°23', ca. 180 m.

Julodis candida: Kubáň & Volkovitsh, 2006: 327 (palaeartic catalogue); Bellamy, 2008: 55 (world catalogue); Howarth & Gillett, 2009: 121, fig. 1 (distribution: new for UAE; comments).

Specimens examined: Liwa, Wazeel oasis, N23°01'27" E54°07'56", 24.xi.2006, J. Batelka & H. Pinda leg., hand coll. (2 ex., JBCP) (Plates 78, 79).

Additional specimens examined (not from the UAE): SAUDI ARABIA: Eastern Province, Ain Dar, 21 km N, x.1975 [sic!], D.A. Pitcher leg. (holotype of *Julodis candida*, NMPC). Ain Dar (21 km N), x.1974 and ii.1975, D.A. Pitcher leg. (7 ex., MMUE). YEMEN: Ramlat As Sabatayn desert, E of Ma'rib (dunes), 14.viii.1996, X. Vazquez leg. (2 ex., MNCA).

Important published records: UAE: E region of Abu Dhabi Emirate, Sweihan area (near al-Ain), 1982 and 1984, J.N.B. Brown leg., I. Hammer coll. (2 ex., EACA; 2 ex., BMNH) (Howarth & Gillett, 2009). SAUDI ARABIA: Jebel Kenzan, [correct: N25°30' E49°44'], viii.1974, D.A. Pitcher leg. (1 paratype, RHCM) (Hołyński, 1996). Central YEMEN: Ramlat As Sabatayn desert, Shabwah ancient city [N15°22' E47°01'20"], 8–9.viii.1936 ["Shibwa"] (1 paratype, RHCM) (Hołyński, 1996).

Remarks: Recorded for UAE by Howarth & Gillett (2009) from the Sweihan – al-Ain area (see above). It is unclear from Howarth & Gillett (2008, 2009) if the record of "*Julodis cailliaudi* [sic!]" from the UAE concerned *J. cailliaudi* sensu lato or *J. candida*.

Host plant: Larval development outside plant roots in the soil. Sands.

Distribution: Eastern Saudi Arabia, UAE, central Yemen (new record).

Julodis euphratica euphratica Laporte & Gory, 1835

Plates 80–81

Julodis euphratica Laporte & Gory, 1835: 18, pl. 6, fig. 25. Type locality: "Orient".

Julodis euphratica euphratica: Kubáň & Volkovitsh, 2006: 327 (palaeartic catalogue; distribution: Jordan, Oman, Saudi Arabia); Bellamy, 2008: 54 (world catalogue).

Specimens examined: Near al-Hayer, N24°33' E55°45', 14.iii.2005, A. van Harten leg., hand coll. (1♂). Az-Zora, N25°26'10" E55°28'42", -9 m, 21.iii.2007, J. Batelka leg. (1 ex., JBCP). Dibba env., N25°31'28" E56°13'44", 110 m, 21.iii.2007, J. Batelka leg. (2 ex., JBCP). Khor Fakkan, N25°57' E56°03', 30.iii.2008, J. Bosák leg., hand coll. (2♂, 2♀). Sharjah Desert Park, N25°17' E55°42', 26.iii.2007, J. Batelka leg. (1 ex., JBCP). Sharjah-Khor Kalba, near tunnel, N24°59' E59°09', 17–18.iv.2006, M. Fibiger leg., light trap (1♀). Wadi Bih, N25°47' E56°04', 100 m, 22.iii.2007, J. Batelka leg. (1 ex., JBCP). Wadi Hayl, N25°04' E56°13', 225 m, 28.iii.2007, J. Batelka leg. (1 ex., JBCP). Wadi Madaq, 20.iv.2006, A. van Harten leg., light trap (2♂); Wadi Madaq, rocks, N25°20'40" E56°05'53", 443 m, 6.iv.2010, V.M. Gnezdilov leg. (3♂); Wadi Madaq, N25°19'32" E56°07'37", 443 m, 18.iii.2007, J. Batelka leg. (1 ex., JBCP). Wadi Safad, N25°13'14" E56°18'40", 125 m, 19.iii.2007,

J. Batelka leg. (1 ex., JBCP). Wadi Shawkah, N27°08' E56°01', 305 m, 10.iv.2010, V.M. Gnezdilov leg. (1 ex., ZIN); Wadi Shawkah, N25°06' E56°02', 250–280 m, 20.iii.2007, J. Batelka leg. (5 ex., JBCP); Wadi Shawkah, 250–280 m, 26.iii.2007, J. Batelka leg. (16 ex., JBCP) (Plate 80).

Additional specimens examined (not from the UAE): ARABIA (Red Sea coast of Saudi Arabia or Yemen): “Arabie” (1 ex., MNHN in coll. Oberthür) (Plate 81). Western IRAN: Lorestan, 1914, B. von Bodemayer leg. (1 ex., NMPC). IRAQ: Al Khalis, ca. 50 m, 7.iv.1977, J. Macek leg. (1 ex., VKCB). OMAN: Breik Qotait, near Khaburah, 20 m, 12.iii.1980, on *Medicago sativa*, S. Matthew & R. Whitcombe leg. (1♂, NMPC). J. Huwayyah, N24°18' E55°51', 4.iii.1993, no. 92, M. Gillett leg. (1 ex., NMPC). Mahdah, N24°27' E56°00', 8.iv.1993, no. 17, M. Gillett leg. (1 ex., NMPC). Mahdah, N24°27' E56°00', 27.v.1993, no. 268, M. Gillett leg. (1 ex., NMPC). Nizwa, 15.v.2004, S. Prepsl leg. (1 ex., SPCV). Ra's al Hadd, N22°31' E59°48', 20.ii.1992, M.D. Gallagher leg. (1 ex., NMPC). Sanaw (50 km S), N22°04' E58°10', 24.iv.1986, D. Horpram leg. (1 ex., NHMB). SAUDI ARABIA: Buraydah, 4.iv.1976, R. Menrad leg. (2 ex., VKCB). Buraydah (40 km NW), Rawdha, 1.v.1980, Khurdyim, W. Büttiker leg. (1 ex., NHMB). Ha'il, iv.1944, A.R. Waterston leg. (2♂, MNHN, as *Julodis euphratica egyptiorum* Marseul, 1865, A. Descarpentries det.). J. Banana, 23.iv.1944, A.R. Waterston leg. (1♂, MNHN, as *J. e. egyptiorum*, A. Descarpentries det.). Riyadh (1 ex., as “*J. iris*”, NMPC, J. Obenberger det.). N of Riyadh, Wadi Hanifah, ca. 600 m, 7.v.1976, W. Büttiker leg. (1 ex., NHMB).

Remarks: Recorded for the UAE by Wingate (1992), Gillett & Howarth (2004) and Howarth & Gillett (2008, 2009). The nominotypic subspecies is widely distributed in the Arabian Peninsula. In the Sinai Peninsula it is substituted by *J. e. egyptiorum* Marseul, 1865. The distribution in Jordan (Katbeh-Bader, 1996) concerns *J. iris* Laporte & Gory, 1835; no other records of *J. e. euphratica* from Jordan are known.

Host plant: Larval development outside plant roots in the soil.

Distribution: Western Iran, Iraq, Oman (Janikova [no date]), Saudi Arabia (e.g. Shalaby, 1961 [as “*J. iris*”]; Bílý, 1979, 1980, 1982, 1985, 1990), UAE. New species for Iran and Iraq. Not in Jordan (see above).

Julodis fimbriata fimbriata (Klug, 1829)

Plate 5

Buprestis fimbriata Klug, 1829: Buprestis no. 2, pl. 1, fig. 2. Type locality: Northern Sudan: Ambikol [“Ambukohl”].

Buprestis arabica Gory, 1840: 15, pl. 3, fig. 13. Type locality: Western Saudi Arabia, Red Sea coast, Jiddah [“Arabie (Djaidda)”]. Synonymy by Marseul (1865).

Sternocera kustai Nonfried, 1892: 335. Type locality: Yemen [“Yemen, Arab. orient”]. Synonymy by Kerremans (1905).

Julodis fimbriata var. *chevalieri* Kerremans, 1914: 245 (available name, established as a subspecific name and by subsequent usage as valid species). Type locality: Central Mali, Tombouctou [“Tombouctou”]. Synonymy by Kubáň (2006).

Julodis chevalieri: Obenberger, 1934b: 162 (characters; comments).

Julodis fimbriata fimbriata: Kubáň & Volkovitsh, 2006: 327 (palaeartic catalogue; synonymy); Bellamy, 2008: 54 (world catalogue).

Specimens examined: ARABIA (Red Sea coast of Saudi Arabia or Yemen): “Arabia” (1 ex., NMPC; 3 ex., ZIN). EGYPT: “Aegyptus” (5 ex., NMPC). Southern EGYPT or northern SUDAN: Nubia [“Nubia”] (2 ex., NMPC; 2 ex., ZIN). ERITREA: “Erythrea”, iii.1933, B. Machulka leg. (2 ex., NMPC). ETHIOPIA: “Abyssinia” (1♀); “Abyssinia 1880” (1♂); “Abyssinia Voy. 1881” (1♂), all A. Raffray leg. (all MNHN in coll. Oberthür). MALI: Hombori (2 km N), 290 m, 7.xii.2006, S15°17'30" W01°41'33", M. Škorpík leg. (12 ex., MSCZ). Tombouctou, 1900, A. Chevalier leg. (4 ex., syntypes of *Julodis fimbriata* var. *chevalieri*, MNHN). MAURITANIA: Massif d'Adrar, Site rupestre d'Agrou, N20°32'14" W12°47'04", 681 m, 20–21.x.2010, A. Reiter leg. (1 ex., MSCZ). NIGER: Air Mts., Massif de Tarouadji, 900 m, 8–12.ix.1947, L. Chopard & A. Villiers leg. (1♂, NMPC). Agadez (10 km W), 5.xi.1978, R. Macek leg. (2 ex., NMPC). Agadez (70 km N), 6.xi.1978, R. Macek leg. (1 ex., NMPC). Assamakka [N19°20' E05°46'13"] (100 km S), 4.xi.1978, R. Macek leg. (1 ex., NMPC). Ifrouane: 10.xi.1978, J. Seifert leg. (2♂, MSCZ); 10.xi.1978, R. Macek leg. (13 ex., NMPC). Western SAUDI ARABIA: “Arabie” (4♂, 2♀, syntypes of *Julodis arabica*, MNHN). Taif-Mecca road, 1980,

W. Büttiker leg. (1 ♂, NHMB). Jiddah, 12.vi.1982, W. Büttiker leg. (1 ♂, NHMB) (Plate 5). SUDAN: "Sudan aegyp." (38 ex., NMPC). Barbar ["Sudan Berber"], Dr. Schwarzenberg (3 ex., NMPC). Dongola (1 ex., NMPC). Juba, iii.1980 (1 ex., ZIN). Khartoum: "Chartum" (1 ex., NMPC); Skála leg. (1 ♂, NMPC); 29.xii.1972, 29.xii.1973 and 22.xi.1977, all V. Seichert leg. (3 ex., VKCB); xi.1973 (1 ex.), 29.xii.1972 (2 ex.), 29.xi.1973 (2 ex.), all V. Seichert leg. (NMPC). Khartoum, Tutti Insel, sands, 6.xi.1959, D.M. Steinberg leg. (1 ex., ZIN). Wad Madani ["Uzd-medani"], 9.xi.1959, at light, D.M. Steinberg leg. (1 ex., ZIN). Southwestern YEMEN: Babal Nakaha, Bajil, 400 m, 9.viii.1999, local collector (1 ♂, VKCB). Bakhshikh, 9.xi.1931, N.N. Filippov leg. (1 ♀, ZIN).

Important published records: Algeria, Djanet oasis, 1912, R. Chudeau mission, Dr. Person leg. (Théry, 1930b). "Afrique occidentale allemande" (Théry, 1930b) – most probably northern Cameroon. Northern Eritrea: Asmara, G. Frasca leg. (MSNM) (Obenberger, 1934a). Libya: Fazzan: Wadi Tanezzuft (Al Barkat), 29.vi.2003; Imin Iyadar, 30.viii.2003; Wadi Aramat (Tassili), close to the Algerian border, 11.x.2003, on *Tamarix* and *Acacia tortilis*, J.-C. Ringenbach leg. (Ringenbach, 2006). Mali, Hombori, 23.viii.1909, more specimens on *Combretum aculeatum* (Théry, 1930b). Mauritania: Near Oualata, Konou, October (Théry, 1934); Djedda, apple tree stem, 29.ix.1956 (Shalaby, 1961); Nema (Descarpentries & Bruneau de Miré, 1963).

Remarks: The occurrence of *Julodis fimbriata fimbriata* in the southeastern Arabian Peninsula is impossible. Howarth & Gillett (2008, 2009) recorded "*Julodis fimbriata*" for UAE; we have not studied their specimens but most probably this record concerned of *J. candida* or *J. fimbriata lacunosa* which was recorded from Oman (see below).

The distribution of *J. fimbriata* in Bellamy (2008) is rather incomplete and it does not cover all published data so we present hereby the new distribution of this species. The record "Massai" in Obenberger (1950) [see also Bílý (1971) "E. Africa (Massai)"] is evidently a wrong interpretation of data by Gestro (1889), who recorded *J. fimbriata* from "Massaua", currently Massawa at the Red Sea shore in northern Eritrea.

Host plant: Larval development outside plant roots in the soil.

Distribution: Southern Algeria (Théry, 1929a, 1930a,b), northern Cameroon and Chad (Descarpentries & Bruneau de Miré, 1963; Descarpentries & Mateu, 1965), southern Egypt (Kerremans, 1908; Innes Bey, 1910; Andres, 1931; Lotte, 1943), Eritrea (Gestro, 1889; Obenberger, 1934a), Ethiopia (Kerremans, 1905), Libya (Bílý, 1973; Ringenbach, 2006), Mali (Kerremans, 1905, 1914), Mauritania (Théry, 1934; Descarpentries & Bruneau de Miré, 1963; new record), Niger (Obenberger, 1950; Descarpentries & Bruneau de Miré, 1963), Sudan (Klug, 1829 [type locality]; Bílý, 1973; new record), western Yemen (Nonfried, 1892; Kerremans, 1905; new record), Saudi Arabia (Gory, 1940; new record).

Julodis fimbriata lacunosa Fairmaire, 1882

Plate 6

Julodis lacunosa Fairmaire, 1882: 49. Type locality: Northern Somalia, ancient Maakhir State, Warsangali Sultanate ["Comalis"].

Julodis argodi Abeille de Perrin, 1900: 3. Type locality: Northern Somalia, Berbera ["Berbera (Somalis)"]. – Kubáň, 2006: 47 (synonymy); Kubáň & Volkovitsh, 2006: 327 (palaeartic catalogue; synonym of *fimbriata lacunosa*); Bellamy, 2008: 65 (world catalogue; synonym of *fimbriata lacunosa*). *Julodis fimbriata lacunosa*: Kubáň, 2006: 41 (resurrected name; new status and combination); Kubáň & Volkovitsh, 2006: 327 (palaeartic catalogue); Bellamy, 2008: 65 (world catalogue).

Specimens examined: OMAN: NE Oman, M. Gillett leg. (1 ex., MGCR). Near Sib, N 23°33' E56°15', 11.viii.1982, M.D. Gallagher leg. (1 ex., NHMB). Wadi Musah, N24°22' E56°05', 4.vi.1993, 341, M. Gillett leg. (1 ex., NMPC). Wadi Andam, N21°19'48" E58°15'24", 90 m, 19.ix.1995, G. Lowe leg. (1 ex., NMPC). "Oman Hr. Stöckli" (1 ♂, NHMB). Northern SOMALIA: Berbera ["Berberah" "Berbera jungle"] (1 ♀, syntype of *Julodis argodi*, MNHN). Ancient Maakhir State: Warsangali Sultanate ["Somali Ouarsangueli"], 1881, G. Révoil leg. (1 ♀, syntype of *Julodis lacunosa*, MNHN).

Remarks: As yet the only specimens known are those listed above. The occurrence of this subspecies in the UAE is highly possible (see above). The records of “*Julodis fimbriata*” in the UAE by Howarth & Gillett (2008, 2009) and in Oman by Janikova [no date] concerns most probably *Julodis fimbriata lacunosa*. Also specimens collected by Gillett in Oman (see above in Specimens examined) were determined as “*Julodis fimbriata* Klug”.

Host plant: Larval development outside plant roots in the soil.

Distribution: Oman, northern Somalia.

***Julodis speculifer dicksonae* Théry, 1936**

Plate 83

Julodis distincta dicksonae Théry, 1936b: 118. Type locality: Southern Kuwait, Urayfjan N28°54' E48°08', ca. 50 m [“N.-E. de l'Arabie, Arafjan, sud de Kumait”].

Julodis speculifer: Bílý, 1979: 215; 1985: 160; 1990: 32 (all as “*speculifera* [sic!]”, localities in Saudi Arabia and Kuwait).

Julodis speculifer dicksonae: Kubáň, 2006: 43 (new combination); Kubáň & Volkovitsh, 2006: 329 (palaeartic catalogue); Bellamy, 2008: 80 (world catalogue).

Specimens examined: Southwestern JORDAN: Tafila (33 km S), Shaubak, N30°32' E35°35', 1250 m, 26.iv.1989, G.C. Bozano leg. (2 ex., SPCV, VKCB). Wadi Rum, Tuwaykil, 16.iv.2002, sands, M. Snížek leg. (3 ex., MSCB). KUWAIT: Southern coastal part, Aratjar, N28°54' E48°08', ca. 50 m, iii.1933, Miss. Dickson leg. (1♂, syntype of *Julodis speculifer dicksonae*, MNHN); Burgan, N28°55' E47°57', 114 m, 5.vi.1988, W. Büttiker leg. (1♂, NHMB). SAUDI ARABIA: Najd Province: near Sakaka, Rajajit, viii.1980, J. Gasparetti leg. (1♀, NHMB). Ha'il, 2–8.iv.1944, A.R. Waterston leg. (2♂, 1♀, MNHN). Riyadh, v.1981, J. Ledoux leg. (1♂, NHMB). Asir Province: Bahara, N21°26' E39°26', 10.v.1976, W. Büttiker leg. (2♂, 1♀, NHMB). Eastern Province, Udhailiyah Camp, 27.iv.1982, No. 164, D.A. Pitcher leg. (1 ex., MMUE, 1♀, NMPC) (Plate 83); Itawiyah, 8.iv.1983, No. 311, D.A. Pitcher leg. (1 ex., MMUE). Abqaiq, saltmine, v.1975, D.A. Pitcher leg. (2 ex., MMUE). Ain Dar (7 km S), 30.iv.1982, No. 179, D.A. Pitcher leg. (2 ex., MMUE).

Remarks: Very poorly known Arabian subspecies (Kubáň & Volkovitsh, 2006) represented in the collections only by a few specimens. Bílý (1979, 1985, 1990) published 12 ex. from Saudi Arabia and 1 ex. from Kuwait as “*Julodis speculifera* [sic!]”. The closest locality of *J. speculifer speculifer* Laporte, 1835, is Iraq (Baghdad) and very similar subspecies, *J. syriaca palmyrensis* Obenberger, 1923 (Plate 82) is distributed in Jordan and Syria. The occurrence of *J. s. dicksonae* in the UAE is highly possible; the closest locality in Saudi Arabia (Udhailiyah) is situated only 250 km west of the UAE (see also Howarth & Gillett, 2009).

Host plant: Larval development outside plant roots in the soil. Sands.

Distribution: Southwestern Jordan (Kubáň & Volkovitsh, 2006; new record), Kuwait (Théry, 1936b [type locality]; Bílý 1990), Saudi Arabia (Bílý, 1979, 1985, 1990).

Subfamily **Polycestinae** Lacordaire, 1857

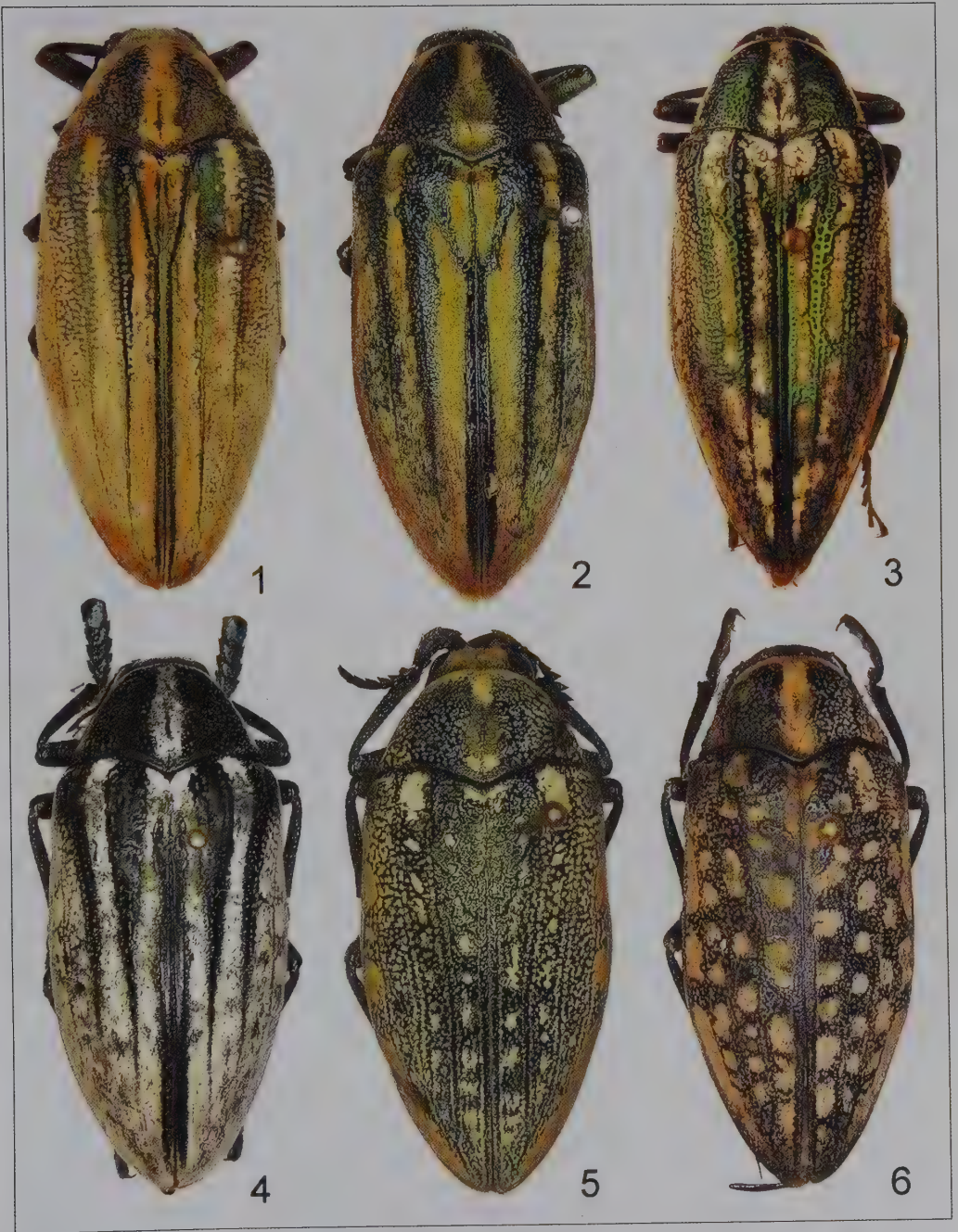
Tribe **Acmaeoderini** Kerremans, 1893

Genus **Acmaeodera** Eschscholtz, 1829

***Acmaeodera (Acmaeodera) guichardi* Levey & Volkovitsh, 1996**

Plates 7, 20, 21, 38

Specimens examined: Adgat env., hotel Le Meridien, al-Aqah, 30.iii.2008, U. Schmidt leg. (1♂, 2♀). Sharjah Desert Park, N25°17' E55°42', 19–22.iii.2008, hand coll., A. van Harten leg. (5 ex.); 16.iii.2009, water trap, C. Schmid-Egger leg. (1 ex.). Wadi Hayl, N25°05' E56°13', 19.iii.2009, C. Schmid-Egger leg. (2 ex., SECB); 225 m, 28.iii.2007, J. Batelka leg. (2 ex., JBCP). Wadi Madaq, N25°18' E56°07', 7–14.iii.2006, yellow and water traps, A. van Harten leg. (26 ex.); 29.iii.–10.iv.2006, (4 ex.); 24.iii.2008, hand coll., A. van Harten leg. (1 ex.); 3–17.ii.2008, water trap, A. van Harten leg. (2 ex.); 20.ii–2.iii.2009, water trap, A. van Harten leg. (1 ex.); 9–11.iii.2009, water trap, A. van Harten



Plates 1–6. 1: *Julodis cailliaudi cailliaudi* (Latreille, 1827), male (syntype of *J. aethiopica* Laporte, 1835, synonym of *cailliaudi cailliaudi*), 30.0 mm, Nubie. 2, 3: *J. cailliaudi mnischechii* Reiche in Thomson, 1860. 2: male (syntype of *J. mnischechii*), 32 mm, Ethiopia; 3: female (syntype of *J. c.* var. *berberae* Abeille de Perrin, 1900, synonym of *cailliaudi mnischechii*), 29.0 mm, Somalia, Berbera. 4: *J. c. spectabilis* Gory, 1840 male, 29.0 mm, "Arabia". 5: *J. fimbriata fimbriata* (Klug, 1829), male, 28.0 mm, Saudi Arabia, Jiddah. 6: *J. f. lacunosa* Fairmaire, 1882, male, 28.0 mm, Oman, near Sib.

leg. (9 ex.); 15–31.x.2010, water trap, A. van Harten leg. (1 ex.). Wadi Shawkah, N25°06' E56°01', 1–7.iv.2007, water trap, A. van Harten leg. (5 ex.); 5–12.v.2007, water trap, A. van Harten leg. (1 ex.); 19–28.xi.2007, water trap, A. van Harten leg. (1 ex.); Wadi Shawkah, N25°06' E56°02', 250–280 m, 20.iii.2007, J. Batelka leg. (1 ex., JBCP); 250–280 m, 20–23.iii.2007, pan traps, J. Batelka leg. (2 ex., JBCP); 250–280 m, 26.iii.2007, J. Batelka leg. (1♂, ZIN). Wadi Wurayah, N25°24' E56°17', 12–14.iv.2005, light trap, T. Pape leg. (3 ex.).

Remarks: *Acmaeodera guichardi* was for the first time recorded from the UAE by Howarth & Gillett (2008, 2009). This species was described from a single female from Oman (Masqat). Male genital structures are illustrated here for the first time (Plates 20, 21). As it turned out, *A. guichardi* is quite common in the UAE, although its biology remains unknown.

Host plant: Unknown.

Distribution: Oman, UAE.

***Acmaeodera (Acmaeotethya) vanharteni* Volkovitsh nov. spec.**

Plates 8, 22, 23

Specimens examined: Holotype: ♂ (ZIN), United Arab Emirates, Wadi Madaq, N25°18' E56°07', 29.iii–10.iv.2006, A. van Harten leg. Paratypes (GMCC, MGCR, NMPC, ZIN, UAEIC): same locality, (1♂, 1♀); 7–14.iii.2006, yellow and white water traps, A. van Harten leg. (3♂, 2♀); 9–11.iii.2009, water traps, A. van Harten leg. (2♂, 1♀). Al-Ain, Markhaniya, 17–18.iv.2000, malt traps, M. Gillett leg. (2♀, MGCR). Wadi Bih (dam), N25°48' E 56°04', 29.iii.2008, hand coll., A. van Harten leg. (1♀); 22–26.iii.2009, water traps A. van Harten leg. (16♂, 13♀); 2–4.iv.2009, water traps, A. van Harten leg. (3♂, 1♀). Wadi Madaq, N25°18' E56°07', 27.iv–14.v.2009, water trap, A. van Harten leg. (1♀). Wadi Safad, N25°13' E56°19', 24.ii.2007, G. Sama leg., *Acacia* spec.?, ex larva, 26., 31.v., 2. vi., 18.vii.2007 (1♂, 1♀ and 5 ex., MGCR). Wadi Shawkah, N25°06' E56°02', 250–280 m, 20–23.iii.2007, pan traps, J. Batelka leg. (1♂, 3♀, JBCP, ZIN). Wadi Wurayah, N25°24' E56°17', 12–14.iv.2005, light trap, A. van Harten leg. (1♂). OMAN: Rostag env., Muscat (ca. 150 km W), iv.1986, Ch. Green leg. (1♂, NMPC). Wadi Fizh, near Zaymi, N24°27', E56°16', 8.ix.1994, 8598, K. Roberts & M. Gallagher leg. (1♀, NMPC). Mahdah, N24°22' E55°55', on flowers of *Convolvulus virgatus*, 28.iii.1999, M. Gillett leg. (2♀, MGCR, ZIN). Wadi A'bul, N24°26' E56°04', on flowers of *C. virgatus*, 28.iii.1999, M. Gillett leg. (2♀, MGCR). Jebel Akhdar, near Bahla, N23°14.3' E57°08.8', 1460 m, [no date,] Ströhlle leg. (1♂, 1♀, GNCW).

Description: Body (Plate 8) small, slender, 3.36 (3.17–3.50; n=20) times as long as pronotum at base, convex, without dorsal curvature; black with feeble steel or bronzy sheen; antennae and legs blackish brown or brown, protibiae slightly expanded apically with straight external margin; pronotal sides only occasionally with small yellowish maculae at posterior corners; elytra dark brown with yellowish marking, without metallic sheen; elytral marking of modified “*saxicola*” type formed by transverse and oblique, curved, frequently interrupted, yellowish stripes at anterior half and 2 pairs of small, sometimes confluent maculae at posterior half; body dorsally covered with short, recumbent and semierect brown and yellowish setae, ventrally with longer white setae; length 6.0 (4.4–7.3) mm, width 1.8 (1.3–2.3) mm.

Head broad, slightly convex, flattened at the middle when seen from above; frons feebly convex, flattened or weakly depressed at the middle, occasionally with medial line or depression, with slightly curved diverging sides. Vertex 1.93 (1.72–2.11) times as wide as transverse diameter of eye and 1.12 (1.06–1.19) times as wide as frons above antennal sockets. Clypeus moderately wide, with broad, deep, arcuate medial emargination anteriorly. Frons with reticulate sculpture of superficial, round umbilicate punctures bearing large micropunctures and inconspicuous grains; intervals about 1/2 diameter of puncture, smooth; head covered with dense, short, semierect, white setae, sometimes mixed with brownish ones. Antennae long, brown, expanded from antennomere 4 in both sexes; in male 1.99 (1.83–2.25) times, in female 1.65 (1.53–1.84) times as long as height of eye; antennomere 2 oval, slightly swollen apically; antennomere 3 conical, expanded toward apex; antennomere 4 sharply

expanded, triangular, slightly wider than long; antennomeres 5–10 slightly transverse, wider than long, trapezoid; antennomere 11 irregularly rounded; antennae in female similar but less expanded.

Pronotum convex, large, slightly wider than elytra at humeri, 1.39 (1.31–1.48) times as wide at base as long, widest at the middle, rarely at posterior 1/3; sides regularly arcuate. Anterior margin nearly straight or weakly bisinuate, basal margin straight. Lateral carina thin, interrupted, only rarely reaching anterior corners, frequently absent. Pronotal surface regularly convex, without medial depression or line; prescutellar fossa frequently absent, lateral fossae punctiform, inconspicuous. Pronotal sides with reticulate sculpture of round umbilicate punctures bearing distinct inner structure, toward disc changing to reticulate-rugose sculpture with poorly marked concentric rugosity; disc medially with pseudoalveolate sculpture of large, deep punctures. Pronotum with short, uniform, recumbent, yellowish vestiture, sometimes mixed with brownish setae; unicolorous, only occasionally with yellow maculae at posterior corners. Anterior prosternal margin weakly emarginate; prosternum evenly convex, covered with pseudoalveolate sculpture of small, deep punctures; meso- and metaventrites with the same sculpture. Hypomeron with reticulate sculpture of larger umbilicate punctures with distinct inner structure.

Elytra elongate, 2.57 (2.40–2.74) times as long as wide at base, convex, slender; sides slightly expanded at humeri, subparallel or feebly diverging toward posterior 1/3, then shortly converging to narrowly rounded apices. Subhumeral incisure shallow but distinct; epipleural serration well developed at posterior 1/3, apical denticles sharp. Strial punctures small, deep, oval, merging on dark background, striae finely sulcate at posterior 1/2. Intervals flattened or slightly convex, subequal, relatively narrow, at disc 2–4 times as wide as striae; 9th interval weakly elevated; intervals covered with very fine, inconspicuous, uni- and multiseriate punctures; background finely shagreened. Elytra dark brown with yellowish marking of modified “*saxicola*” type formed by transverse and oblique, curved, frequently interrupted, yellowish stripes at anterior 1/4 and 1/2, and 2 pairs of small, often confluent maculae at posterior half; elytral pattern in males is more extensive than that in females; elytra covered with dense, short (less than interval width), semierect, uni- or multiseriate yellowish and brownish setae.

Legs dark bronze or brown; metacoxal plates with posterior margin nearly straight, without lateral tooth. Protibiae slender, gradually widened to the apices with external margin straight; meso- and metatibiae slender, metatibiae bearing comb of brownish setae externally. Tarsomeres subequal; 5th wide, expanded apically; tarsal pads developed on tarsomere 4, rudimentary on tarsomeres 1–3. Tarsal claws long, curved, with internal tooth in male reaching apical 1/3; in female, shorter, reaching about 1/2.

Abdomen black with steel or bronzy sheen; covered with uniform ocellate sculpture of dense umbilicate punctures with indistinct inner sculpture, smaller and sparser on the sternal discs. Abdomen covered with dense, recumbent, white setae. Anal ventrite in male short, widely rounded apically, that in female longer and narrowly rounded apically.

Male: Aedeagus as in Plates 22, 23.

Female: Ovipositor of tubular type, long, approximately 5 times as long as expanded apical part.

Differential diagnosis: *Acmaeodera vanharteni* nov. spec. belongs to the *A. (Acmaeotethya) cisti* Wollaston, 1862 species-group (Volkovitsh, 1979), diagnosis see under *A. batelkai* nov. spec.

Host plant: *Acacia* (Fabaceae) (G. Sama, see Specimens examined).

Remark: The name “*A. omanensis* Volkovitsh” in Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009) is a **nomen nudum**.

Distribution: Oman, UAE.

Etymology: This species is named in the honour of Antonius van Harten, the coordinator of the "Arthropod fauna of UAE" project.

Acmaeodera (Acmaeotethya) batelkai Volkovitsh **nov. spec.**

Plates 9, 24, 25, 39, 41

Specimens examined: Holotype: ♂ (ZIN), United Arab Emirates, Ra's al-Khaimah, env. Darah, by the road to Kalba, 25.xi.2006, J. Batelka & H. Pinda leg., reared from dead wooden stalks of *Physorrhynchus chamaerapistrum*, emerged on vii.2007. Paratypes (9♂, 6♀, JBCP, NMPC, UAEIC, ZIN): same locality and labels.

Description: Body (Plate 9) small, wide, 3.35 (3.13–3.53; $n=14$) times as long as pronotum at base, slightly convex, without dorsal curvature; black with feeble steel or bronzy sheen; antennae and legs yellowish brown, protibiae spatulate with slightly serrate external margin (Plate 41); pronotal sides with small yellowish maculae at anterior corners and, more rarely, at posterior corners, occasionally these maculae partially or entirely reduced; elytra brown or black and brown with yellow ochre marking, without metallic sheen; elytral marking of irregular "*rubromaculata*" type formed by longitudinal and oblique yellowish stripes and confluent maculae; body dorsally covered with very short, recumbent and semierect brown and yellowish setae, ventrally with longer white setae; length 5.9 (4.9–6.7) mm, width 1.8 (1.5–1.9) mm.

Head broad, flattened when seen from above; frons feebly convex or flattened, without medial line or depression, with nearly straight, weakly diverging sides. Vertex 1.78 (1.50–2.00) times as wide as transverse diameter of eye and 1.07 (1.00–1.15) times as wide as frons above antennal sockets. Clypeus rather broad, with broad, deep, arcuate medial emargination anteriorly. Frons with ocellate, here and there changing to reticulate sculpture of superficial, round umbilicate punctures with inconspicuous inner structure; intervals less than diameter of puncture, slightly shagreened and rugulose; covered with short, semierect yellowish and brownish setae. Antennae long, yellowish brown, expanded from antennomere 4 in both sexes; in male 1.96 (1.83–2.16) times, in female 1.80 (1.61–1.90) times as long as height of eye; antennomere 2 oval, slightly swollen; antennomere 3 conical, expanded towards apex; antennomere 4 sharply expanded, triangular, slightly wider than long; distal antennomeres 5–10 weakly transverse, wider than long, roundly triangular; antennomere 11 irregularly rounded; antennae of female similar but less expanded.

Pronotum convex, large, slightly wider than elytra at humeri, 1.40 (1.30–1.48) times as wide at base as long, widest at the middle; sides regularly arcuate. Anterior margin bisinuate, slightly arcuately or angularly projecting forward, basal margin straight. Lateral carina entire, reaching anterior corners, slightly curved. Pronotal surface regularly convex, without medial depression or line; prescutellar fossa absent, lateral fossae punctiform, inconspicuous. Pronotal sides with uniform reticulate sculpture of round umbilicate punctures with inconspicuous inner structure, not forming concentric rugosity towards disc; disc medially with pseudoalveolate sculpture of large deep punctures. Pronotum with short, uniform, recumbent, yellowish and brownish setae; with yellow maculae at anterior and more rarely at posterior corners, occasionally reduced. Anterior prosternal margin weakly emarginate; prosternum evenly convex, covered with ocellate sculpture of small, deep punctures, sparser on process; meso- and metaventrals with the same sculpture. Hypomeron bearing similar sculpture of larger punctures.

Elytra weakly elongate, 2.43 (2.35–2.51) times as long as wide at base, slightly convex, wide; sides weakly expanded at humeri, subparallel or feebly diverging towards posterior 1/3, then arcuately converging to widely rounded apices. Subhumeral incisure shallow but distinct; epipleural serration poorly marked at posterior 1/4, apical denticles wide, obtuse. Strial

punctures small, superficial, round, merging; striae finely sulcate at posterior 1/2. Intervals flattened, subequal, broad, at disc 3–5 times as wide as striae; 9th interval not elevated; intervals with fine, inconspicuous, multiseriate punctures; background smooth. Elytra dull, brown or black and brown with yellow ochre marking of “*rubromaculata*” type formed by irregular, longitudinal and oblique yellowish stripes and confluent maculae; covered with dense, short (less than wide of interval), semierect, multiseriate, brownish and yellowish setae.

Legs: Femora black and brown, tibiae and tarsi yellowish; metacoxal plates with posterior margin nearly straight, without lateral tooth. Protibiae spatulate with slightly serrate external margin (Plate 41); meso- and metatibiae slender, metatibiae bearing comb of yellowish setae externally. Tarsomeres subequal; 5th wide, expanded apically; tarsal pads developed on tarsomeres 3–4, each larger towards distal end, rudimentary on tarsomeres 1–2. Tarsal claws long, curved, with internal tooth in male reaching apical 1/4, in female, shorter, reaching about 1/3.

Abdomen black with steel or bronzy sheen; covered with uniform ocellate sculpture of dense umbilicate punctures with indistinct inner structure, smaller and sparser on sternal discs. Abdomen covered with dense, recumbent, white and brownish setae. Anal ventrite in male short, obtuse apically, transversely depressed, that in female longer and narrowly rounded apically, shallowly depressed.

Male: Aedeagus as in Plates 24, 25.

Female: Ovipositor (Plate 39) of tubular type, long, approximately 3.5 times as long as expanded apical part, with deeply emarginated apex.

Differential diagnosis: *Acmaeodera batelkai* nov. spec. belongs to the *A. cisti* species-group (Volkovitsh, 1979) and comes close to *A. vanharteni* nov. spec. but differs by wider and more flattened body; sparser and less differentiated head puncturation with indistinct inner structure (that in *A. vanharteni* nov. spec. with distinct micropunctures and central grains); lateral carina distinct and entire, visible from above (that in *A. vanharteni* nov. spec. interrupted or absent); usually two lateral maculae at anterior and posterior corners present (in *A. vanharteni* nov. spec. only rarely one macula at posterior corners present); wider and more flat elytral intervals; less differentiated elytral pattern (Plates 8, 9); shape of anal ventrite and aedeagus structure (Plates 22–25). The main diagnostic character of *A. batelkai* nov. spec. is that the spatulate protibiae has a slightly serrate external margin (Plate 41) (in *A. vanharteni* nov. spec. protibiae gradually widened towards apices with straight external margin).

Note: All specimens have been reared from the host plant, covered with wooden dust and some of them slightly deformed. For this reason colour of body and appendages in the specimens emerged in the natural condition can be partly different.

Host plant: *Physorrhynchus chamaerapistrum* (Brassicaceae), reared from dead wooden stalks.

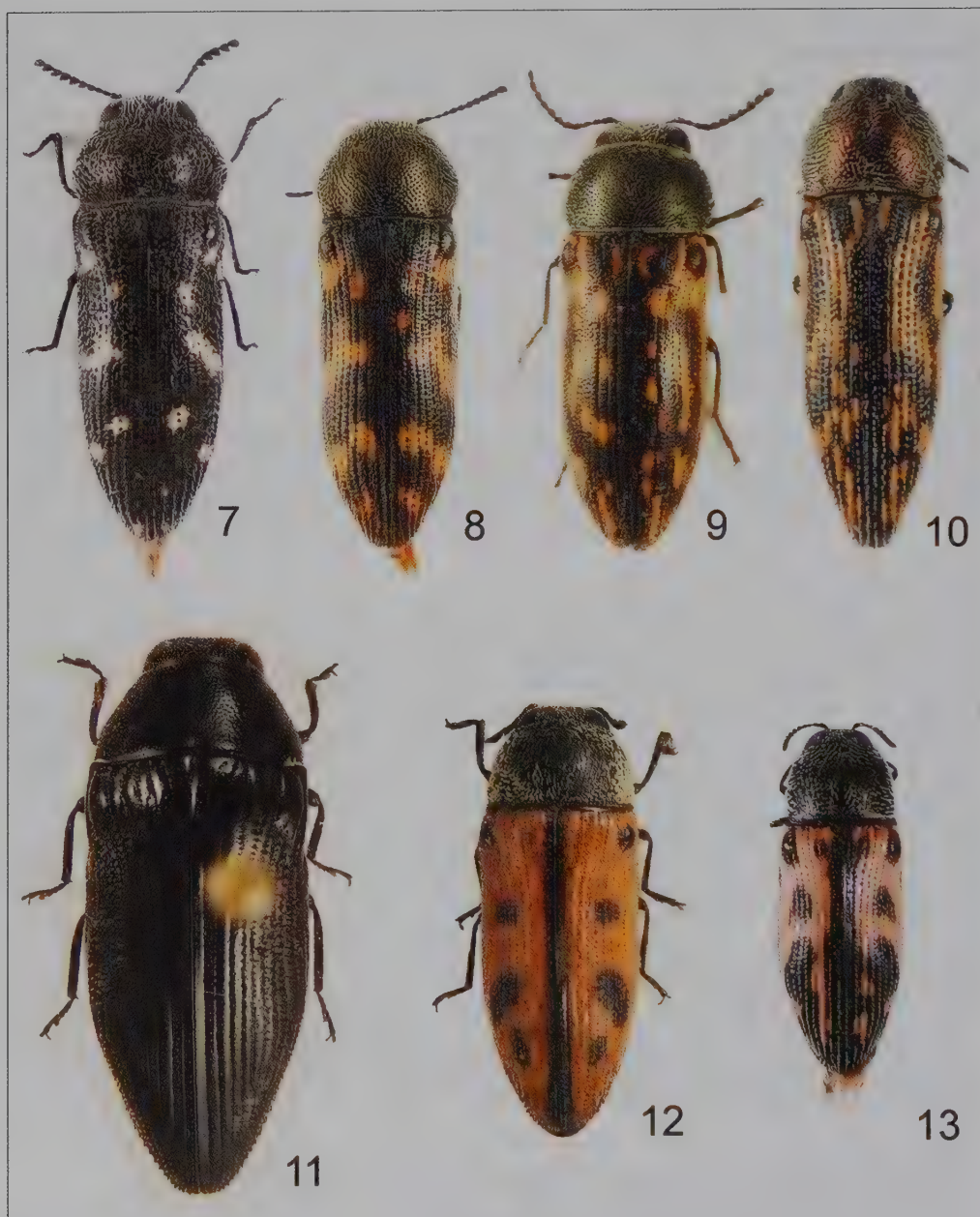
Distribution: UAE.

Etymology: This species is dedicated to Jan Batelka, one of collectors of this species.

***Acmaeodera (Cobosiella) holynskii* Volkovitsh nov. spec.**

Plates 10, 26, 27

Specimens examined: Holotype: ♂ (ZIN), United Arab Emirates, Sharjah, N25°21' E55°24', 24.ix–9.x.2005, light trap, A. van Harten leg. Paratypes (BMNH, DBCR, GMCC, HMCM, NMPC, UAEIC, VKCB, ZIN): Al-Ajban, N24°36' E55°01', 25.vii–21.viii.2006, Malaise trap, A. van Harten leg. (1♂); 7–14.viii.2006, Malaise trap, A. van Harten leg. (1♀); 28.viii–4.ix.2006, Malaise trap, A. van Harten leg. (1♂). Northwestern INDIA: Radjastan Province: Thar Desert, Pushkar, 29.ii.1996, Geis leg. (1♂, with additional labels “Zucht aus [reared from] *Acacia*”, “Schlüpf [emerged] vii.1996”) (2♂, 1♀, HMCM, ZIN). Uttaranchal State: “Out of Sundari wood. Dehra Dun” [back side: 01–13–7–1911], “50”,



Plates 7–13. 7: *Acmaeodera (Acmaeodera) guichardi* Levey & Volkovitsh, 1996, male, 6.6 mm, UAE, Wadi Shawkah; 8: *A. (Acmaeotethya) vanharteni* Volkovitsh nov. spec., male, holotype, 6.1 mm; 9: *A. (A.) batelkai* Volkovitsh nov. spec., male, holotype, 5.7 mm; 10: *A. (Cobosiella) holynskii* Volkovitsh nov. spec., male, holotype, 6.2 mm; 11: *A. (Ptychomus) arabica* Gory, 1840, 10.5 mm, Oman, Mahdah; 12: *Xantheremia (Xantheremia) pantherina* (Bílý, 1979), 6.5 mm, Israel, Arava valley, 9 km SW of Yahel; 13: *X. (X.) prepsli* Volkovitsh nov. spec., female, holotype, 5.7 mm. (Photographs 7–10, 13 M.G.Volkovitsh)

"*Acmaeodera arya* Hol., det. R. Holynski, 1978", "*Acmaeodera arya* Holynski, 1978, Holotype [handwritten, red]" (1♂, BMNH); same labels (part without Dehra Dun indication), 20, 30.vi., 1–20.vii, 3, 7, 10, 24.vii., "37", "40", "42", "48", "51", "57", "*Acmaeodera arya* Hol., det. R. Holynski, 1978", "Paratype [handwritten, red]" (2♂, 2♀, 5 ex. [partly damaged], BMNH, ZIN). Madhya Pradesh State: Hoshangabad, Rahatgaon, Hoshangabad, 16.vii.1927, from *Acacia catechu*, C.P. S.N. Chatterjee leg. (1♀, NMPC). Southern IRAN: Hormozgan Province: Hasan Langi, N27°23' E56°50', 155 m, 17.vii.2004, S. Kadlec leg. (1 ex., NMPC). Isin env., N27°19' E56°16', 70 m, 21.iv.2006, *ex larva*, *Acacia* sp., D. Baiocchi leg. (2♂, DBCR, ZIN). Southern PAKISTAN: Baluchistan Province: Khuzdar District, Awaran, 4–7.iv.1993, S. Bečvář leg. (1♂, VKCB). Sind Province: Kirthar National Park, Karchat, 25.ii–4.iii.1995, D. Hauck & L. Čížek leg. (1♂, 2♀, VKCB, ZIN). QATAR: Jeryan Al Batna, Rawdat Rashed env., N25°10' E51°15', 4.iii.2003, G. Sama leg. (1 ♀, GMCC). W Qatar, Al Jemailiyah (4–10 km W), N25°30' E50°57', dead in *Acacia* sp., G. Sama leg. (1 ex., GMCC).

Additional specimens not included among paratypes: Northern INDIA: Uttaranchal State: "Out of Sundariwood [2 with Dehra Dun indication]", "20, 30.vi., 13, 24.vii.1911", "36", "38", "39", "41", "45", "46", "47", "*Acmaeodera arya* Hol., det. R. Holynski, 1978", "Paratype [handwritten, green]", "coll. RBHolynski BPgxh – BPgxh" (2♂ and 5 ex. of unknown sex, RHCM).

Description: Body (Plate 10) of medium size, strongly elongate, 3.47 (3.24–3.82; n=19) times as long as pronotum at base, slender, convex, with poorly defined dorsal curvature; blackish-bronze, nearly black, occasionally with violet sheen; elytra black and brown with yellowish marking, sometimes yellowish colour dominant; elytral marking irregular and asymmetric formed by longitudinal, oblique and transverse stripes and maculae, dark elements concentrating on 1st–2nd and 5–9th intervals, sides ochre-yellow, sometimes with reddish pigments at anterior corners and subapical 1/3 (some specimens from India); head and pronotal disc covered with long, elytra with short setiform scales, sides of pronotum, thoracic and abdominal ventrites with dense, oval branched scales, nearly concealing background; length 7.5 (5.1–10.2) mm, width 2.2 (1.4–3.0) mm.

Head broad, flattened when seen from above; frons flat, sometimes with medial line, slightly transversely depressed just above clypeus, with straight, distinctly diverging sides. Vertex 2.05 (1.94–2.23) times as wide as transverse diameter of eye and 1.10 (1.05–1.17) times as wide as frons above antennal sockets. Clypeus narrow, with arcuately curved lateral branches, and with broad, deep, angular medial emargination anteriorly. Frons with ocellate, sometimes changing to reticulate sculpture of large, elongate, superficial umbilicate punctures bearing flat grains and inconspicuous micropunctures; intervals less than 1/2 diameter of punctures; background nearly completely concealed by dense, long, recumbent setiform scales. Antennae in male 1.99 (1.88–2.18) times, in female 1.49 (1.33–1.71) times as long as height of eye; in male sharply expanded from antennomere 4; antennomere 2 weakly elongate, swollen at the middle; antennomere 3 1.5 times longer than 2nd, slightly expanded apically; antennomere 4 sharply expanded, triangular, nearly as wide as long; distal antennomeres 5–10 slightly transverse, wider than long; antennomere 11 elongately rhomboid; antennae in female similar but less expanded.

Pronotum rather convex and elongate, 1.37 (1.32–1.44) times as wide at base as long, widest at midlength, rarely posterior midlength or anterior midlength; sides arcuately converging towards anterior corners and weaker to posterior corners. Anterior margin slightly bisinuate with arcuately projecting medial lobe, basal margin widely emarginated. Lateral carina entire, straight. Pronotal surface convex, with distinct, sometimes deep medial depression; basal fossae well developed, deep. Pronotal sides with coarse reticulate, nearly alveolate sculpture of small, round umbilicate punctures, towards disc changing to reticulate-rugose sculpture of coalescent umbilicate punctures; disc medially with simple punctate sculpture of large deep punctures separated by intervals equal to or less than diameter of puncture. Pronotal sides with oval branched scales along lateral carina; remaining surface with long, recumbent, white

setiform scales. Anterior prosternal margin nearly straight, bordered by fine sulcus; prosternum evenly convex, covered with coarse ocellate sculpture of small, deep punctures, sparser on process; meso- and metaventrites with the same sculpture. Hypomeron bearing reticulate sculpture of large, polygonal, superficial umbilicate punctures.

Elytra strongly elongate, 2.57 (2.40–2.76) times as long as wide at base, convex, narrow; sides slightly widened at humeri, subparallel towards posterior 1/3, then elongately converging to narrowly rounded apices. Subhumeral incisure deep, antero-lateral angles acute, strongly projecting forward; epipleural serration formed by rather big, saw-like denticles at posterior 1/4, apical denticles claw-shaped. Strial punctures large, deep, separated at anterior half, completely merging at posterior 1/2. Intervals convex, subequal, narrow, at disc 1.5–3 times as wide as striae; 9th interval elevated and finely serrated; covered with very fine, inconspicuous, uni- or multiseriate punctures; background finely shagreened. Surface covered with short (less than width of intervals), transparent, finely lanceolate, uni- and multiseriate scales. Elytra dull, blackish-brown with yellowish pattern or yellowish with dark marking as described above (Plate 10).

Legs blackish-bronze, sometimes with violet sheen; metacoxal plates with posterior margin nearly straight, without lateral tooth. Tibiae slender, protibiae gradually expanded and bearing lateral tooth; metatibia bearing comb of yellowish setae externally. Tarsomeres subequal; 5th wide, expanded apically; tarsal pads developed on tarsomeres 1–4, each larger toward distal end. Tarsal claws long, curved, with internal tooth at the middle.

Abdomen blackish-bronze with violet sheen; sides of ventrites 1–2 with ocellate sculpture of dense umbilicate punctures changing to small simple punctures on sternal discs. Abdomen covered with dense, oval, white branched scales, nearly concealing background; medially with sparser recumbent scales. Anal ventrite in male short, regularly rounded apically, bordered with fine sulcus, that of female longer and narrowly rounded.

Male: Aedeagus as in Plates 26, 27.

Female: Ovipositor of tubular type, long, approximately 5 times as long as expanded apical part.

Differential diagnosis: In spite of some differences *Acmaeodera holynskii* nov. spec. belongs to the subgenus *Cobosiella* Volkovitsh, 1979, based on such characters as slender body with acuminate elytral apices (Plate 10) and, particularly, branched scales on ventral surface and pronotal sides, and male genitalia. It differs from all other species of the subgenus by irregular and asymmetric elytral marking; elongated pronotum with distinct medial depression and concave pronotal base; dense scaly pubescence, nearly entirely concealing background on the head, pronotal sides and ventral surface; male antennae long, expanded from antennomere 4 (also in *A. glebi* Volkovitsh, 2009), and aedeagus structure (Plates 26, 27).

Host plant: *Acacia catechu*, *Acacia* spp. (Fabaceae), “Sundariwood”. The name “Sundariwood” is usually referred to *Heritiera fomes* (Malvales: Sterculiaceae), however, this tree is a specialized element of mangroves and its presence at Dehra Dun area seems doubtful. It’s quite possible that “sundariwood” means the local name for some another tree.

Distribution: Northwestern India, southern Iran, southern Pakistan, Qatar, UAE.

Etymology: This species is dedicated to Roman Hołyński, a distinguished expert in Oriental buprestids who first paid attention to this species in BMNH collection.

Acmaeodera (Ptychomus) arabica Gory, 1840

Plate 11

Specimens examined: ETHIOPIA: “Abyssinien” (1 ex., NMPC), E. Holm det. ISRAEL: Wadi Gerguda, 20.vi.19.., H. Bytinski-Salz leg. (1 ex., NMPC), S. Bílý det. OMAN: Mahdah, N24°27' E56°00': 3.v.1993, no. 252, M. Gillett leg. (1 ex., NMPC) (Plate 11); 21.v.1993, no. 253, M. Gillett leg. (1 ex., NMPC); 31.v.1993, no. 295, M. Gillett leg. (1 ex., NMPC), all S. Bílý det. SAUDI ARABIA: Jizan,

25.iii.1983, collected by A. Talhouk, S. Tilkian, R. Abouzouheyrh, M. Eltaher & A. Elmadi (1 ex., NMPC), M.G. Volkovitsh det.

Remarks: Recorded from UAE by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009). Absent in examined material.

Host plant: *Acacia* (Volkovitsh, 2004).

Distribution: Ethiopia, Israel, Oman, Saudi Arabia, Yemen (Volkovitsh, 2006), UAE (Gillett & Gillett, 2005).

Genus *Xantheremia* Volkovitsh, 1979

Xantheremia (Xantheremia) pantherina (Bílý, 1979)

Plate 12

Recorded from UAE by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009) as *Acmaeodera*. Absent in examined material. Comment see below: *Xantheremia prepsli* nov. spec.

Host plant: *Calligonum commosum* (Polygonaceae) (Volkovitsh, 2004).

Distribution. Egypt, Iraq, Israel, Saudi Arabia (Volkovitsh, 2006).

Xantheremia (Xantheremia) prepsli Volkovitsh nov. spec.

Plates 13, 36, 37, 40

Specimens examined: Holotype: ♀ (ZIN), United Arab Emirates, Wadi Shawkah, N25°06' E58°03', 5–12.v.2007, water trap, A. van Harten leg. Paratypes (ZIN, UAEIC, NMPC, MGCR, MJCP, MNCA, SPCV, ZIN): Wadi Shawkah, N25°06' E58°03', 5–12.v.2007, water traps, A. van Harten leg. (2♀, NMPC, ZIN). Sharjah Desert Park, N25°17' E55°42', 25.ii–25.iii.2006, light trap, A. van Harten leg. (1♂, 1♀, ZIN). Southern IRAN: Hormozgan Province: N of Bandar-e Abbas, Hoshangan (4 km NEE), 30.iv.2002, S. Kadlec leg. (2 ex., NMPC). SE of Minab, Angohran, 24.iv.2002, M. Johanides leg. (1 ex., MJCP). Minab, 18–20.v.2006, S. Prepsl leg. (8♂, 19♀, SPCV, ZIN). Northern OMAN: Jebel Huwarrah, N24°52' E55°19', 7.iv.1999, on *Iphiaona aucheri/Pulicaria glutinosa* flowers, M. Gillett leg. (2♂, 1♀, MGCR, ZIN). Jebel Auha, Buraimi, N24°17' E55°50', 8.iv.1999, on *Pulicaria glutinosa* flowers, M. Gillett leg. (1♀, 2 ex., MGCR); same locality, 16.iv.1999, M. Gillett leg. (12 ex., MGCR). Southern PAKISTAN: Baluchistan Province: Bela, 3–4.v.1993, S. Prepsl leg. (34♂, 16♀, 11 ex., NMPC, SPCV, TCMC, VKCB, ZIN). SAUDI ARABIA: Najd, N of Al Khurmah, N22°25'47" E41°47'58", *Acacia* sp., ex larva, 2007 (2♂, MNCA).

Description: Body (Plate 13) small, 3.18 (3.05–3.38; n=12) times as long as pronotum at base, slender, slightly flattened, with poorly defined dorsal curvature; blackish-bronze with bronzy or steel sheen; elytra ochre-yellow, elytral pattern brown or blackish-brown, variable, more or less symmetrical, consisting of sutural stripe and maculae on 4–8th intervals sometimes merging in large macula at posterior half of elytra or nearly entirely reduced; dorsally covered with narrow lanceolate scales, ventrally with broad lanceolate or oval scales nearly concealing background; length 5.8 (5.0–6.7) mm, width 1.8 (1.5–2.1) mm.

Head moderately broad, flattened and feebly depressed in the middle when seen from above; frons flat, with shallow medial depression or fossa, with straight, markedly diverging sides. Vertex flattened, with distinct medial carina, 1.67 (1.47–1.84) times as wide as transverse diameter of eye and 1.14 (1.06–1.22) times as wide as frons above antennal sockets. Clypeus wide, with deep, angular anterior emargination. Frons with striate sculpture of very fine, concentric striae consisting of merging micropunctures, sometimes with a few obliterated umbilicate punctures just above clypeus; intervals much wider than striae, finely shagreened. Head covered with fine lanceolate scales not concealing background. Antennae relatively long, expanded from antennomere 4 in both sexes; in male 1.83 (1.63–1.94) times, in female 1.58 (1.39–1.83) times as long as height of eye; in male antennomere 2 oval, elongate; antennomere 3 shorter, also elongate; antennomere 4 triangular, as wide or nearly as wide as 5th;

antennomeres 5–10 triangular, nearly as wide as long; antennomere 11 irregular; in female distal antennomeres 4–10 shorter and more transverse.

Pronotum weakly transverse, slightly narrower than elytra at humeri, 1.42 (1.35–1.50) times as wide at base as long, widest at base; sides subparallel at basal half, arcuately converging at anterior half. Anterior margin nearly straight, basal margin straight. Lateral carina well marked, entire, reaching anterior angles, nearly straight. Pronotal surface convex, without medial groove or line, with inconspicuous smooth medial stripe; basal fossae inconspicuous; sides above lateral carina with a few series of elongate, asperate, umbilicate punctures changing to striate sculpture of very fine, concentric striae similar to those on the head; medial stripe with very fine micropunctures, intervals finely shagreened; sides covered with broad lanceolate or oval scales concealing background just above lateral carina, remaining surface with thin sparse lanceolate scales. Anterior prosternal margin nearly straight bordered with fine sulcus; prosternum convex, prosternal process with concentric striation; hypomeron with reticulate-rugose sculpture of large elongate umbilicate punctures; meso- and metaventrites with ocellate sculpture; thoracic segments covered with oval scales concealing background.

Elytra elongate, 2.42 (2.35–2.48) times as long as wide at base, moderately convex, wide; sides subparallel or slightly diverging towards posterior 1/3, then arcuately converging towards narrowly rounded apices. Subhumeral incisure arcuate, distinct; epipleural serration formed by small, poorly visible subapical denticles. Strial punctures large and deep on light background and small shallow on dark one, separated at anterior half, merging, finely sulcate at posterior 1/2. Intervals flat, subequal, at disc 1.5–2.0 times as wide as striae; 9th interval weakly elevated, smooth; intervals bearing small, uniseriate punctures on feebly shagreened background. Elytra covered with thin lanceolate uniseriate scales. Elytra yellow with brown or blackish-brown, variable, more or less symmetric marking, consisting of sutural stripe and maculae on 4–8th intervals (Plate 13), sometimes merging in large macula at posterior half of elytra or nearly entirely reduced.

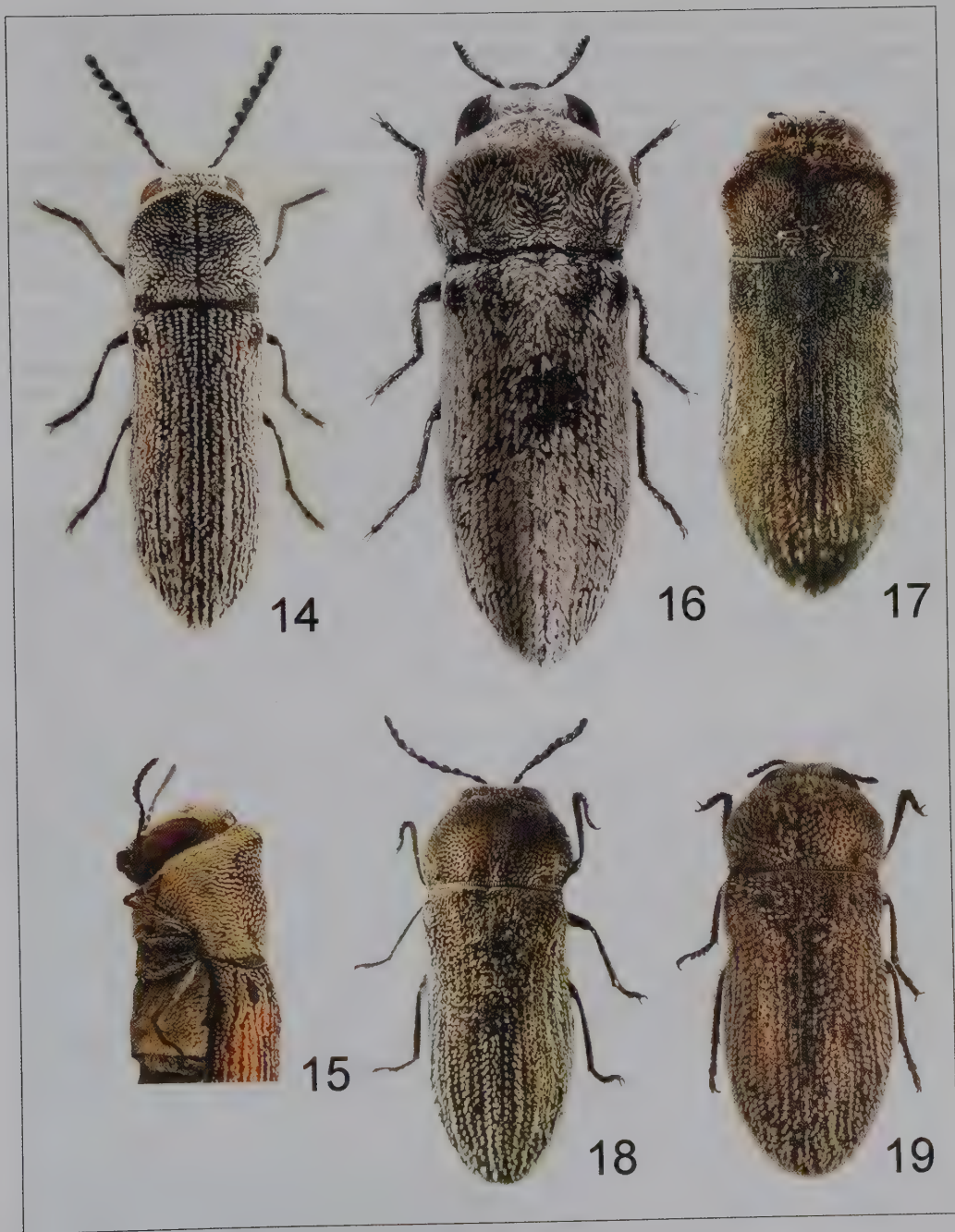
Legs blackish-bronze; metacoxal plates with emarginate posterior margin. Tibiae slender, metatibiae bearing comb of yellowish setae externally. Tarsomeres subequal; tarsal pads poorly developed on tarsomere 4, rudimentary on tarsomeres 1–3. Tarsal claws long, curved, with internal subapical tooth.

Abdomen blackish-bronze, sides with ocellate changing to punctate sculpture towards discs; covered with wide lanceolate or oval scales, nearly concealing background on sides; medially with very thin scales. Anal ventrite regularly rounded and bordered with sulcus apically, without depressions.

Male: Aedeagus as in Plates 36, 37.

Female: Ovipositor as in Plate 40.

Differential diagnosis: *Xantheremia prepsli* nov. spec. belongs to the *X. (Xantheremia) flavipennis* (Klug, 1829) species-group (Volkovitsh, 1979). It comes close to *X. philistina* (Marseul, 1865) from Israel, Syria and Egypt, and *X. pantherina* (Bílý, 1979) known from Egypt, Iraq, Israel and Saudi Arabia. *Xantheremia prepsli* nov. spec. differs from these species by longer antennae expanded from antennomere 4 which is subequal in width to 5th; by shape of distal antennomeres which are triangular, nearly as long as wide in male (in *X. pantherina* and *X. philistina* antennae expanded from antennomere 5, distal antennomeres strongly transverse, approx. 2 times as wide as long); by very fine striation of head and pronotum without traces of umbilicate punctures; and by different structure of aedeagus and ovipositor.



Plates 14–19. 14, 15: *Acmaeoderella (Omphalothorax) argentea* Volkovitsh nov. spec., male, paratype, 6.4 mm, Iran, Hormozgan. 14: Dorsal view; 15: pronotum, lateral view. 16: *A. (Acmaeoderella) pseudonivetecta* Volkovitsh nov. spec., male, paratype, 8.4 mm. 17: *A. (Euacmaeoderella) cf. nivifera* (Abeille de Perrin, 1894), male, 6.8 mm. 18: *A. (E.) ballioni* (Ganglbauer, 1888), male, 4.7 mm, UAE, Fujairah. 19: *A. (E.) squamosa* (Théry, 1914), 5.0 mm, Israel, Central Negev, Nahal Neqarot, 11 km SE of Mizpé Ramon. (Photographs 14–18 M.G.Volkovitsh.)

Note: The records of *X. flavipennis*, *X. pantherina* and *X. philistina* from UAE (Gillett & Gillett, 2005, Howarth & Gillett, 2008, 2009 [as *Acmaeodera flavipennis* and *A. pantherina*]) most probably belonged to *X. prepsli* nov. spec.

Host plant: *Acacia* (Fabaceae).

Distribution: Southern Iran, Oman, southern Pakistan, Saudi Arabia, UAE.

Etymology: This species is named in honour of Stanislav Prepsl (Vyškov, Czech Republic), the first collector of this species.

Genus *Acmaeoderella* Cobos, 1955

***Acmaeoderella (Omphalothorax) argentea* Volkovitsh nov. spec.** Plates 14, 15, 28, 29

Specimens examined: Holotype: ♂ (ZIN), United Arab Emirates, N of Ajman, N25°26' E55°29', 18–22.v.2008, water traps, A. van Harten leg. Paratypes (MGCR, MJCP, NMPC, VKCB, ZIN): Ar-Rafah, N25°43' E55°51', 18–22.v.2008, water traps, A. van Harten leg. (1♂, 1♀, NMPC, ZIN). OMAN: Jebel Huwarrah, N24°52' E55°19', 14.v.1999, on *Acacia tortilis*, M. Gillett leg. (1♂, MGCR). Southern IRAN: Hormozgan Province: SE of Minab, Angohran, 24.iv.2002, P. Kabátek, M. Johanides & S. Kadlec leg. (1♂, 1♀, 5 ex., MJCP, VKCB, ZIN). Kuh-e Surmeh Mts., W slope, Hajjiabad (55 km S), N27°58' E55°58', 2000 m, 10.v.1973, loc. no. 195, Exp. Nat. Mus. Praha (1♀, NMPC).

Description: Body (Plate 14) small, 3.65 (3.47–3.79; n=8) times as long as pronotum at base, slender, elongate, subcylindrical, with poorly defined dorsal curvature; dark bronze; elytra brown with feeble bronzy sheen; elytral pattern of “*virgulata*” type, nearly regular, consisting of 2 longitudinal yellowish stripes on 3rd and 6–9th intervals, sometimes partly reduced, expanded or confluent; head, pronotal sides and ventral surface covered with regular, oval, white scales entirely concealing background, sparser on pronotal disc, and forming longitudinal uni- or multiseriate stripes on elytra; length 6.0 (5.2–7.2) mm, width 1.6 (1.4–1.9) mm.

Head broad, slightly convex, entirely covered with oval scales concealing background; frons flattened, without medial depression or line, with nearly straight, strongly diverging sides. Vertex flattened or slightly convex, without medial carina or line, 2.13 (1.94–2.25) times as wide as transverse diameter of eye and 1.18 (1.13–1.23) times as wide as frons above antennal sockets. Clypeus very narrow, with anterior margin widely emarginated. Frons with ocellate sculpture of small, round, superficial umbilicate punctures with large grains and indistinct micropunctures, denser at sides; intervals less than 1/2 of diameter of puncture. Antennae long, sharply dimorphic, in male 2.15 (2.03–2.28), in female 1.64 (1.59–1.69) times as long as height of eye, expanded from antennomere 4 in both sexes; antennomere 2 slender, slightly swollen at the middle; antennomere 3 slender, slightly longer than second; in male antennomere 4 sharply expanded, as wide as long; antennomeres 5–10 triangular, as wide as long; antennomere 11 elongate, irregularly oval. In female antennomere 4 conical, narrower than 5th; antennomeres 5–10 triangular, much less expanded, slightly wider than long; antennomere 11 elongate, irregular, weakly transverse.

Pronotum (Plates 14, 15) elongate, 1.04 (1.00–1.06) times as wide at base as long, widest at anterior 1/5; sides slightly diverging towards anterior corners, shortly converging to base and anterior margin. Anterior margin widely, arcuately projecting forward, basal margin weakly emarginated. Lateral carina absent. Pronotal surface in lateral view depressed anteriorly and posteriorly of the middle, medially slightly elevated (Plate 15); anterior margin swollen and in frontal view deeply triangularly emarginated at the middle by medial line; basal fossae inconspicuous; pronotal surface with uniform coarse alveolate sculpture of large, deep alveolae with inconspicuous internal structure. Sides with large oval scales entirely concealing background; disc with shorter and sparser oval scales directed radially and not

concealing background. Thorax ventrally entirely covered with oval scales; anterior prosternal margin deeply emarginated; prosternum convex, covered with small, transverse umbilicate punctures; meso- and metaventrites with the same sculpture; hypomeron with larger, round, superficial umbilicate punctures bearing large central grains.

Elytra strongly elongate, 2.63 (2.45–2.74) times as long as wide at base, subcylindrical, slender; sides subparallel towards posterior 1/4, then shortly converging to narrowly, sometimes separately rounded apices. Subhumeral incisure, arcuate, lateral margin slightly curved posteriorly; epipleural serration formed by small, narrow, sharp denticles at posterior 1/4. Strial punctures large, elongate, deep, adjacent and impressed along elytral length. Intervals flat, narrow, at disc equal or 1.5–2 times as wide as striae; 9th interval slightly elevated, without denticles; covered with small, uniseriate or confused punctures on coarse transversely rugose background. Elytra brown, sometimes with distinct bronzy sheen; elytral pattern of “*virgulata*” type formed by 2 longitudinal yellowish stripes on 3rd and 6–9th intervals, sometimes partly reduced or expanded. Elytra covered with oval white scales, forming longitudinal uni- or multiseriate (on expanded intervals) stripes.

Legs blackish-bronze; metacoxal plates subparallel with slightly emarginated posterior margin; femora covered with dense oval scales. Tibiae slender; metatibiae bearing comb of yellowish setae externally. Tarsomere 1 distinctly shorter than 2nd and 3rd together; tarsal pads poorly developed, each larger towards distal end. Tarsal claws with sharp internal tooth at basal 1/3.

Abdomen blackish-bronze, covered with uniform ocellate sculpture of small, round umbilicate punctures, sparser and smaller on discs, and with overlapping oval scales, completely concealing background. Anal ventrite short, obtuse apically in both sexes.

Male: Aedeagus as in Plates 28, 29.

Female: Ovipositor of tubular type, rather long.

Differential diagnosis: *Acmaeoderella argentea* nov. spec. belongs to the *A. (Omphalothorax) adspersula* (Illiger, 1803) species-group and comes closest to *A. densisquamis* (Abeille de Perrin, 1904). It differs by shorter body and pronotum [in *A. densisquamis* body 3.83 (3.44–4.29) times as long as pronotal width at base, pronotum 0.99 (0.97–1.03) times as wide at base as long]; weakly convex vertex and less diverging frontal sides (in *A. densisquamis* vertex strongly convex as seen from above); contour of pronotum at lateral view (in *A. densisquamis* pronotal surface nearly straight, without medial elevation and swollen anterior margin which is only shallowly depressed by distinct medial groove); uniform pronotal sculpture (in *A. densisquamis* alveolae obliquely elongated and their walls form oblique rugae), and aedeagus structure. Larvae of *A. densisquamis* feed in *Pistacia* (D. Gianasso, D. Baiocchi, pers. comm.) while *A. argentea* nov. spec. is possibly associated with *Acacia*.

Host plant: ?*Acacia* (Fabaceae).

Distribution: Southern Iran, Oman, UAE.

Etymology: The species name reflects somewhat silvery appearance resulting from white scales interference.

***Acmaeoderella (Acmaeoderella) pseudonivetecta* Volkovitsh nov. spec.** Plates 16, 30, 31
Specimens examined: Holotype: ♂ (ZIN), United Arab Emirates, Ar-Rafah, 18–28.vi.2008, water traps, A. van Harten leg. Paratypes (GMCC, MGCR, MNCA): Al-Ain al-Faidah, N24°03' E55°42', 13.v.1999, in trap at ground level in saline sand with *Halopeplis perfoliata*, M. Gillett leg. (1♂, MGCR). Al-Ain, Markhaniya, 12.v.2000, on salt bush (1ex., MGCR). Southern IRAN: Hormozgan Province: Pahel env., 17.iv.2007, 30, *Zygophyllum* [living roots], ex larva, 24.iv.2007, G. Magnani leg. (1♂, GMCC). OMAN: Ibri (50 km NW), 2.iv.1995, J. Wittmann leg. [ex coll. M. Hauser] (1♂, MNCA).

Description: Body (Plate 16) of medium size, 3.20 (3.14–3.25; $n=4$) times as long as pronotum at base, robust, subcylindrical, with poorly defined dorsal curvature; blackish-bronze with coppery sheen; elytra blackish-bronze, unicolorous; entirely covered with large oval scales, completely concealing background ventrally, sparser and narrower on pronotum, and forming longitudinal stripes on elytra; length 8.4 (7.8–8.8) mm, width 2.6 (2.4–2.8) mm. Head broad, convex, contour arcuate, completely covered with oval scales, concealing background; frons convex, occasionally with medial line and with straight, strongly diverging sides. Vertex convex, with short but distinct medial carina, 1.80 (1.59–1.92) times as wide as transverse diameter of eye and 1.32 (1.22–1.43) times as wide as frons above antennal sockets. Clypeus very narrow, with nearly straight anterior margin. Frons covered with ocellate sculpture of small, round, superficial umbilicate punctures with indistinct micropunctures; intervals less than diameter of puncture. Antennae (male) very short, 0.89 (0.83–0.94) times as long as height of eye; sharply expanded from antennomere 5; antennomere 2 oval, swollen; antennomere 3 short, slightly expanded apically; antennomere 4 conical, nearly as long as 3rd; antennomeres 5–10 sharply transverse, about 2 times as wide as long; antennomere 11 transverse, trapezoid; proximal antennomeres covered with dense scales.

Pronotum nearly globose, convex, 1.25 (1.23–1.29) times as wide at base as long, widest at the middle; sides regularly arcuate. Anterior margin widely, slightly angularly projecting forward, basal margin weakly concave. Lateral carina inconspicuous. Pronotal surface convex, without medial depression or line; basal fossae poorly marked, visible due to radially orientated scales; with coarse alveolate sculpture of small, deep alveolae, concealing by scales laterally and along anterior margin; disc with oval and widely lanceolate, semierect scales forming transverse comb of oppositely directed scales. Anterior prosternal margin weakly emarginate; prosternum convex, covered with fine simple punctures on shagreened background; meso- and metaventrites with similar sculpture; thoracic segments entirely covered with oval scales concealing background.

Elytra moderately elongate, 2.38 (2.32–2.41) times as long as wide at base, subcylindrical, wide; sides subparallel towards posterior 1/3, then sharply converging to narrowly rounded apices. Subhumeral incisure deep, arcuate; epipleural serration formed by small, poorly visible denticles. Strial punctures small, oval, superficial, separated at anterior half, merging and forming fine sulci at posterior 1/2, poorly visible against coarse, transversely rugose background. Intervals flat, subequal, at disc 3.5–4 times as wide as striae; 9th interval weakly elevated, smooth; covered with small, confused punctures. Elytra covered with large, oval, overlapping scales, forming longitudinal stripes on disc, completely concealing background laterally (Plate 16). Elytra dull, blackish-bronze.

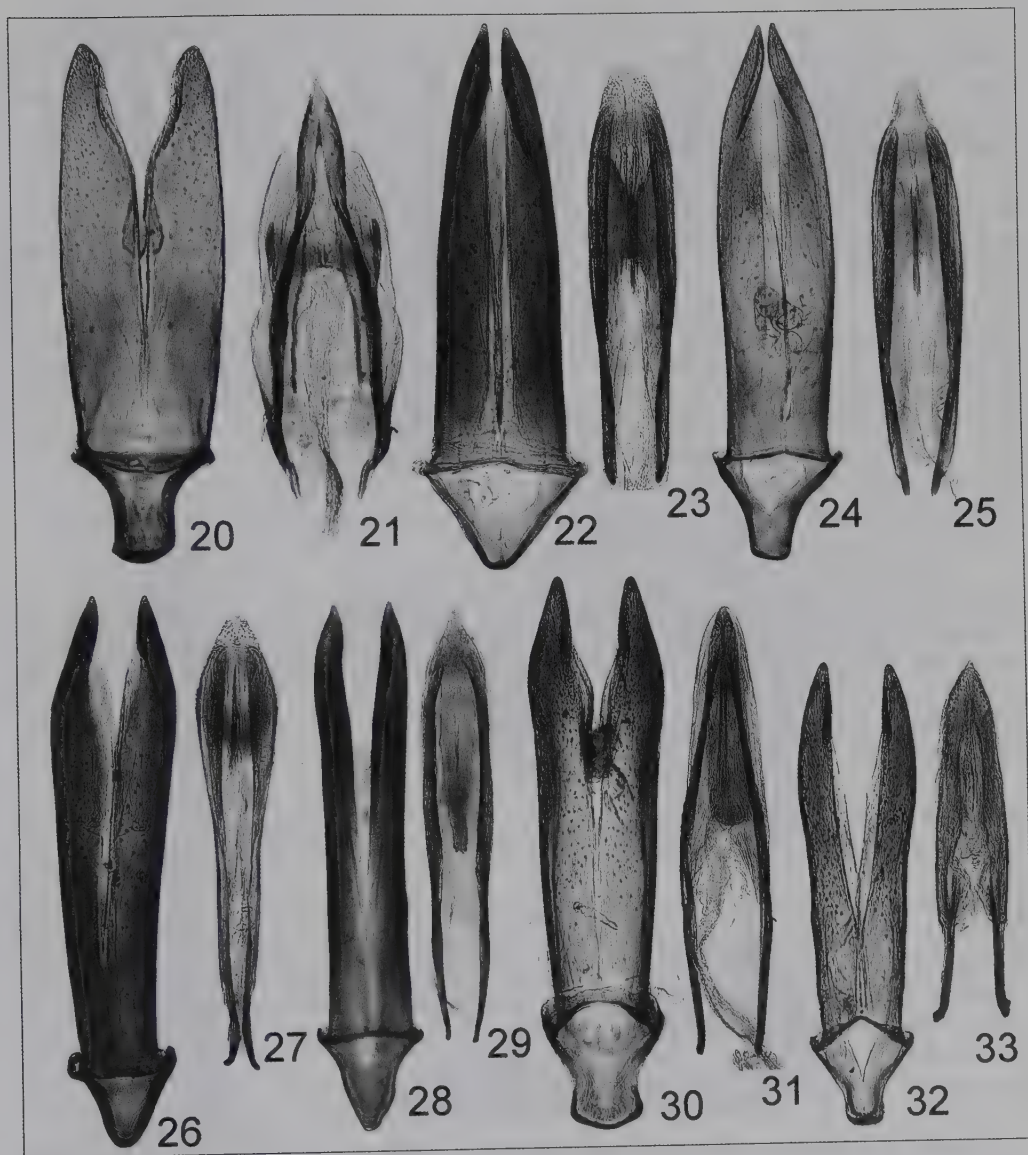
Legs blackish-bronze, sometimes with coppery sheen, covered with dense oval scales; metacoxal plates subparallel with straight posterior margin. Tibiae slender, gradually expanded towards apices; metatibiae bearing comb of yellowish setae externally. Tarsomeres subequal; tarsal pads developed on tarsomere 4, rudimentary on tarsomeres 1–3. Tarsal claws long, curved, swollen at base, without internal tooth.

Abdomen blackish-bronze, covered with wide overlapped scales, completely concealing background.

Male: Aedeagus as in Plates 30, 31.

Female: Unknown.

Differential diagnosis: *Acmaeoderella pseudonivetecta* nov. spec. comes close to *A. nivetecta* Volkovitsh, 1976, and *A. alfieri* (Théry, 1929). It differs from *A. nivetecta* by short antennae with strongly transverse antennomeres (in *A. nivetecta* antennae longer than height of eye; distal antennomeres no more than 1.5 times as wide as long); pronotum with transverse comb



Plates 20–33. 20, 21: *Acmaeodera (Acmaeodera) guichardi* Levey & Volkovitsh, 1996, Oman, Wadi A'bul, microslide no. 1729. 20: Tegmen (1.20 mm); 21: Penis (0.75 mm). 22, 23: *A. (Acmaeotethya) vanharteni* Volkovitsh nov. spec., paratype, UAE, Wadi Madaq, microslide no. 1821. 22: Tegmen (1.35 mm); 23: Penis (1.10 mm). 24, 25: *A. (A.) batelkai* Volkovitsh nov. spec., paratype, UAE, Darah env., microslide no. 1818. 24: Tegmen (1.55 mm); 25: Penis (1.30 mm). 26, 27: *A. (Cobosiella) holynskii* Volkovitsh nov. spec., holotype, microslide no. 1822. 26: Tegmen (1.60 mm); 27: Penis (1.30 mm). 28, 29: *Acmaeoderella (Omphalothorax) argentea* Volkovitsh nov. spec., paratype, UAE, Al-Rafah, microslide no. 1855. 28: Tegmen (1.40 mm); 29: Penis (1.20 mm). 30, 31: *A. (Acmaeoderella) pseudonivetecta* Volkovitsh nov. spec., paratype, UAE, Ain al Faidah, microslide no. 1829. 30: Tegmen (1.85 mm); 31: Penis (1.55 mm). 32, 33: *A. (Euacmaeoderella) cf. nivifera* (Abeille de Perrin, 1894), microslide no. 1828. 32: Tegmen (1.30 mm); 33: Penis (1.00 mm). (Photographs M.G. Volkovitsh.)

of scales (in *A. nivetecta* scales not forming a comb, discal scales short, usually as long as diameter of alveolae); tarsal claws simple with swollen base (in *A. nivetecta* claws with large sharp internal tooth); the larvae of the new species feed in the roots of *Zygophyllum* (Zygophyllaceae), while larvae of *A. nivetecta* live in the roots of *Heliotropium grande* (Boraginaceae). According to the Théry description (Théry, 1929b) *A. pseudonivetecta* nov. spec. differs from *A. alfierii* by smaller size (in *A. alfierii* body length 10 mm, width 3.75 mm); frons without depression; antennae shorter than height of eye; elytral striae formed by small, superficial punctures (in *A. alfierii* striae coarse, formed by deep punctures); elytral scales arranged linearly (in *A. alfierii* scales arranged irregularly); tarsal claws without internal tooth (in *A. alfierii* claws with large internal tooth at base).

Remarks: It is quite possible from the indications that the records of *Acmaeoderella squamosa* (Théry, 1914) (see below) in Gillett & Howarth (2004), Gillett & Gillett (2005), and Howarth & Gillett (2008, 2009) actually belonged to this new species. One paratype (MGCR) collected by Gillett bears a label "*Acmaeoderella squamosa*".

Host plant: *Zygophyllum* (Zygophyllaceae), in living roots.

Distribution: Southern Iran, Oman, UAE.

Etymology: The species name reflects the similarity of the new species to *A. nivetecta* from the Central Asia, northern Iran and Afghanistan.

Acmaeoderella (Euacmaeoderella) ballioni (Ganglbauer, 1888) Plates 18, 34, 35

Specimen examined: Dibba env., N25°31'58" E56°13'44", 110 m, 21.iii.2007, J. Batelka leg. (1♂, ZIN).

Host plant: In Central Asia (Kazakhstan, Turkmenistan) this species is associated mainly with *Convolvulus* (Convolvulaceae).

Distribution: Afghanistan, Iran, Kazakhstan, Tadjikistan, Turkmenistan, UAE, Uzbekistan.

New species for the UAE.

Acmaeoderella (Euacmaeoderella) cf. nivifera (Abeille de Perrin, 1894) Plates 17, 32, 33

Specimen examined: Wadi Shawkah, N25°06' E56°02', 250–280 m, 26.iii.2007, J. Batelka leg. (1♂, ZIN).

Note: The single specimen of this species was collected dead with all the appendages broken, pubescens partly lost, and colouration possibly changed while drying. In the course of dissection to extract genitalia the specimen was destroyed, which made it unsuitable for adequate description. Supposedly this species is related to *Acmaeoderella nivifera* (Abeille de Perrin, 1894) but differs by larger size and coarse alveolate sculpture of pronotum. Fresh specimens are needed for appropriate description.

Host plant: Unknown.

Acmaeoderella (Euacmaeoderella) squamosa (Théry, 1914) Plate 19

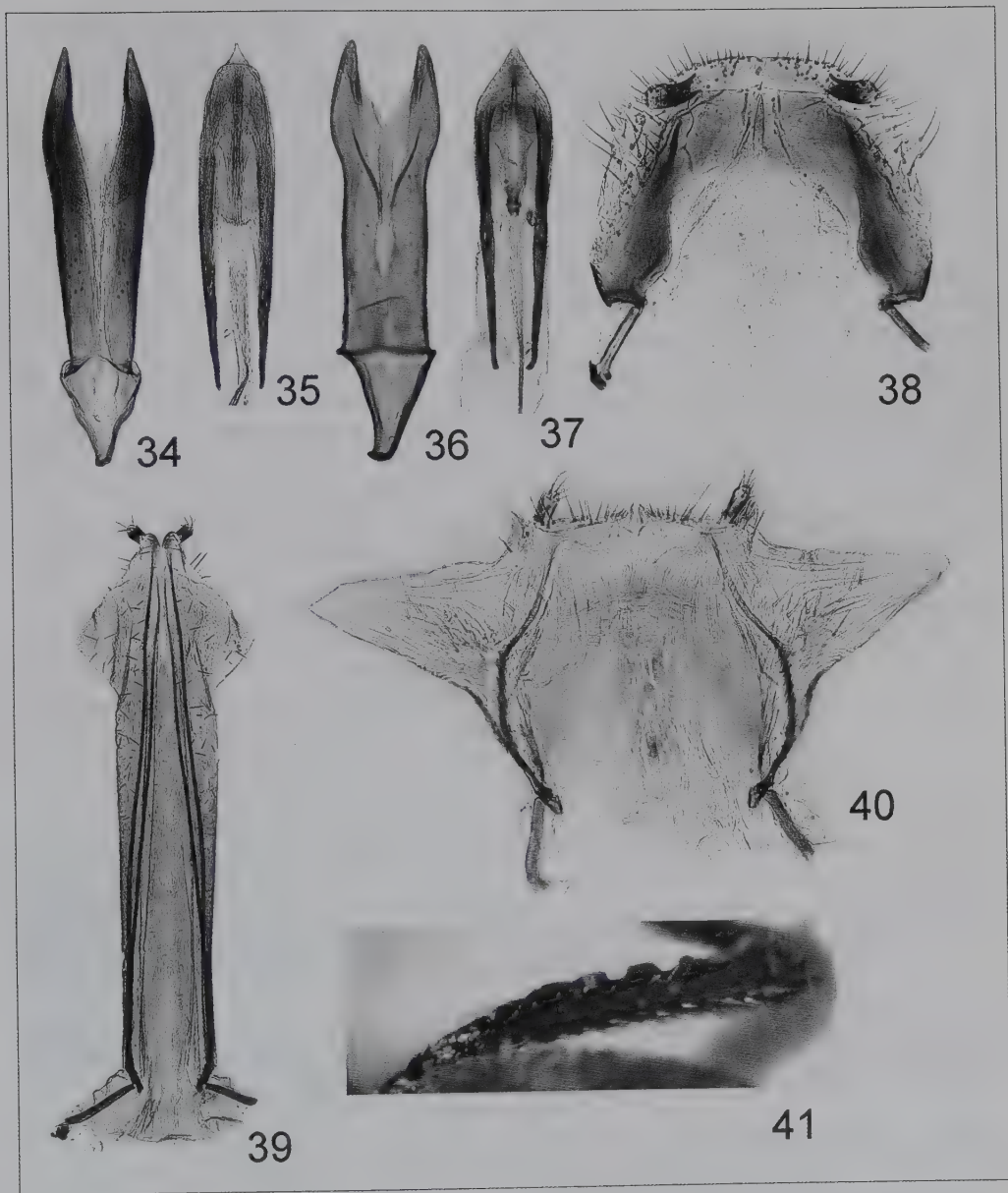
Recorded from UAE by Gillett & Howarth (2004), Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009). This species was absent in examined material. The record needs confirmation because there are undescribed new species from the same group collected in Oman (see above: *Acmaeoderella pseudonivetecta* nov. spec.).

Host plant: Unknown.

Distribution. Egypt, Iraq, Israel, Saudi Arabia, Tunisia (Volkovitsh, 2006).

Tribe **Polycestini** Lacordaire, 1857

Genus ***Pseudocastalia*** Kraatz, 1896



Plates 34–41. 34–37: Aedeagus. 34, 35: *Acmaeoderella* (*Euacmaeoderella*) *ballioni* (Ganglbauer, 1888), UAE, Dibba env., microslide no. 1827. 34: Tegmen (1.10 mm); 35: Penis (1.00 mm). 36, 37: *Xantheremia* (*Xantheremia*) *prepsli* Volkovitsh nov. spec., paratype, UAE, Sharjah Desert Park, microslide no. 1852. 36: Tegmen (1.55 mm); 37: Penis (1.05 mm). 38–40: Ovipositors. 38: *Acmaeodera* (*Acmaeodera*) *guichardi* Levey & Volkovitsh, 1996, Oman, Wadi A'bul, microslide no. 1730 (0.60 mm); 39: *A. (Acmaeotethya) batelkai* Volkovitsh nov. spec., paratype, UAE, Darah env., microslide no. 1819 (2.00 mm); 40: *X. (X.) prepsli* Volkovitsh nov. spec., UAE, Wadi Shawkah, microslide no. 1854 (0.65 mm). 41: Protibia *A. (A.) batelkai* Volkovitsh nov. spec., paratype, UAE, Darah env. (Photographs M.G. Volkovitsh.)

***Pseudocastalia arabica arabica* (Gestro, 1877)**

Plate 42

Specimens examined: DJIBOUTI: Gibdo [N11°53'55" E42°39'04"], v.1905, K. Katona leg. (1♂, 1♀, ZIN) (Plate 42). Obock, v.1902 (1♀, NMPC); vi.1902 (1 ex., MNHN). ETHIOPIA: "Abyssinia" (1 ex., MNHN). Harar, Coll. Plason (1♂, NMPC). SAUDI ARABIA: Jiddah (2♀, NMPC). Northern SOMALIA: Berbera (1♂, 4♀, NMPC; 1 ex., MNHN). Ancient Maakhir State: Warsangali Sultanate ["Somali Ouarsangueli"], 1881, G. Révoil leg. (1 ex., MNHN). Southern VIETNAM: "Long Xuyen Cochinchine Dorr. [printed]" (more ex., MNHN, 1♂, 2♀, NMPC). YEMEN: Aden, 6.vi.1876, O. Beccari leg. (♀, lectotype of *Polycesta arabica*, designated by Holm (1982), MNHN; 2 paralectotypes, MNHN, ZMHB); Aden (4 ♀, NMPC, ZIN; 1 ex., MNHN); Aden, Coll. Argod (1♂, 1♀, NMPC).

Important published records: Djedda, in house, 3.vii.1956 (Shalaby, 1961).

Recorded from UAE (Abu Dhabi, 1988–1990, B. Brown leg., 16 ex.) by Howarth & Gillett (2009). Absent in examined material.

Host plants: Unknown. According to records of this species inside buildings (Shalaby, 1961) it is highly possible that the larvae of this species can develop within the dead, dry or technical wood like related polycestine species. Beetles of some species were found within the wooden parts of historical buildings. *Strigoptera fairmairei* (Waterhouse, 1904) in temple wooden column (northern Vietnam, Ninh Binh, V. Kubáň, pers. observ.), *Strigopteroides depressa depressa* (Fabricius, 1775) in wooden door of Emir's Palace (Uzbekistan, Chiva, S. Bílý & V. Kubáň, pers. observ.), in wooden column's in Emir's Palace (Uzbekistan, Bukhara, M.G. Volkovitsh, pers. observ.), in construction beam (Central Asia, Gussakovskii, 1949), *Thurntaxisia alexandri* Schatzmayr, 1929 in telegraph poles (Greece, Mühle et al., 2000).

Remarks: Howarth & Gillett (2009) recorded the presence of this species in BMNH from Syria, India and Korea, which seems extremely doubtful. These localities are not mentioned either in the recent revisions of *Pseudocastalia* (Cobos, 1981, Holm, 1982) or catalogues (Bellamy, 2008), nor were specimens with such labels found during MGv's study of the polycestine collection in BMNH (February, 2009). Nevertheless, Kerremans (1902) indicated "Aden, Cochinchine", and "Aden, Tonkin, Abyssinie, Somali" (Kerremans, 1905). Cobos (1981) regarded the record "Tonkin" to be a mistake. Moreover, V. Kubáň found in the collections of MNHN and NMPC a few specimens (see Specimens examined) of *P. arabica arabica* from southern Vietnam ("Long Xuyen Cochinchine"). In spite of these data we still have doubts that the natural geographic distribution of *P. a. arabica* reaches southeastern Asia. This occurrence could be explained as a result of an occasional introduction of this species with wood or mislabelling. Further findings are necessary to confirm the occurrence of this species in southeastern Asia.

Distribution: Djibouti (Fairmaire, 1892; new record), Eritrea (Gestro, 1889), Ethiopia (Kerremans, 1905; new record), Saudi Arabia (Holm, 1982), Yemen (Gestro, 1877 [type locality]), UAE (Howarth & Gillett, 2009), Somalia (Fairmaire, 1882; new record).

Subfamily **Chrysochroinae** Laporte, 1835

Tribe **Paratassini** Bílý & Volkovitsh, 1996

Genus ***Paratassa*** Marseul, 1882

***Paratassa orientalis* Bílý & Volkovitsh, 1996**

Plate 43

Specimens examined: Margham env., N24°55' E55°38', 163 m, 24.xi.2007, J. Batelka & H. Pinda leg. (1♂, 1♀, JBCP).

Host plant: *Diplotaxis hara* (Bílý, 1983; Bílý & Volkovitsh, 1996).

Distribution: Western Iran (Khuzestan), UAE. New species for the UAE.

Tribe **Chrysochroini** Laporte, 1835Genus ***Steraspis*** Dejean, 1833***Steraspis (Steraspis) speciosa arabica*** Waterhouse, 1904

Plate 44

Specimens examined: Southern OMAN: Dhofar Province: Rakhyut env., 20–50 m, 1–8.viii.1999, R. Červenka leg. (1♂, VKCB). Taqah env., 0–100 m, viii.1999, S. Jákł leg. (1♂, 1♀, NMPC, VKCB). Mughsayl, ix.2000, D. Gianasso leg. (1♂, 1♀, NMPC). Wadi Darbat, ix.2000, D. Gianasso leg. (1♀, NMPC). SAUDI ARABIA: Riyadh (30 km SSE), near Al Ha'ir, Wadi Shaib Luha, 17.xii.1976, W. Büttiker leg. (2 ex., NHMB). Southern YEMEN, Kawr Sayban Mt., NW Al Mukalla, N14°37' E49°03', 575 m, 29.iii.2007, P. Kabátek leg. (1 ex., NMPC).

Remarks: Waterhouse (1904) described *Steraspis arabica* as a species from Mascat (Oman). From Oman it is recorded by Janikova [no date] as "*Steraspis speciosa*". From southeastern Saudi Arabia (Rub'al Khali desert) recorded by Blair (1931). From central part of Saudi Arabia (S of Riyadh; see above) recorded by Bílý (1979) as "*Steraspis speciosa* Klug, 1829". Gillett & Howarth (2004) recorded *S. arabica* first for the UAE (Jebel Hafit), subsequently recorded also by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009). Curletti (2009) treated *S. arabica* as an Arabian subspecies of African *S. speciosa* (Klug, 1829). Distribution see also Kubáň (2006) and Bellamy (2008).

Host plant: *Acacia* (field observation from Oman, J. Horák, pers. comm.).

Distribution: Oman, southeastern Saudi Arabia, UAE, southern Yemen. New species for Yemen.

Tribe **Sphenopterini** Lacordaire, 1857Genus ***Sphenoptera*** Dejean, 1833***Sphenoptera (Tropeopeltis) arabica*** Gory, 1841

Plate 45

Specimens examined: Southwestern OMAN: Dhofar Province: Rakhyut village env., 50 m, viii.1999, on *Acacia* sp., S. Jákł leg. (2♂, 1♀, NMPC, VKCB). YEMEN: Southwestern Yemen: Al Hudaydah NEE, Jabal Bura', N14°52' E43°24', 225–600 m, 30.x–1.xi.2005, P. Kabátek leg. (2♂, 2♀, PKCP, VKCB) (Plate 45); same data but 200–800 m, J. Halada leg. (1♀, NMPC). Southeastern Yemen: Al Ghaydah NE, Jabal al Fatk, Hawf, N16°38' E53°04', 0–160 m, 15.x.2005, reared from *Boswellia* sp., P. Kabátek leg. (1♀, VKCB).

Recorded from the UAE by Gassouma (1991) and subsequently by Howarth & Gillett (2008, 2009). We have not studied specimens published by Gassouma (1991) and Howarth & Gillett (2008, 2009). A widely distributed polyphagous species developing in the dead twigs and stems of *Acacia* spp. (P. Kabátek and Z. Košťál, pers. comm.).

Host plant: Fruit trees (Gassouma, 1991); branches and trunks of *Moringa peregrina* (Moringaceae) (Halperin & Argaman, 2000; Volkovitsh, 2004); *Acacia* (Fabaceae), *Boswellia* (Burseraceae) (new records).

Distribution: Egypt, Israel, Oman, Saudi Arabia, UAE, Yemen. New species for Yemen.

Sphenoptera (Tropeopeltis) vanharteni Kalashian **nov. spec.**

Plates 46, 47, Figures 3, 6

Specimens examined: Holotype: ♂ (NMPC), United Arab Emirates, Wadi Maidaq, N25°18' E56°07', 23.iii.2010, hand coll., K. Mahmood leg. Paratype: Wadi Wurayah, N25°24' E56°17', 3.iv.2007, water trap, A. van Harten leg. (1♀, MKCY).

Description: Body elongate, 2.80–2.85 times as long as wide, strongly convex, in male metallic green with golden reflection, in female dark bronze, frons with reddish reflection anteriorly. Surface shine, not shagreened. Body dorsally nearly completely glabrous with few

very short setae anteriorly, pronotum and elytra laterally with very short nearly invisible single setae; sternum and abdomen with rather distinct moderately long setae rather dense laterally, sparse medially. Length 7.1–7.2 mm, width at base of elytra 2.5–2.6 mm.

Head broad, slightly narrower than pronotum anteriorly; eyes slightly convex, not projecting beyond outline of head. Vertex 2.4–2.5 times as wide as transverse diameter of eye. Clypeus in shape of crescent with rounded apices, microreticulated. Frons with sides nearly straight and subparallel, moderately convex, anteriorly flattened, with pair of small and very indistinct elevations at the level of middle of eyes (in front view). Supraantennal keels poorly separated, laterally smoothed, not reaching inner margins of eyes. Frons with rather coarse and dense macropunctures, becoming slightly smaller and sparser posteriorly. Micropunctures sparse, indistinct. Antennae about 1.5 times as long as eye height, serrate from slightly longitudinal antennomere 4, antennomere 3 short, slightly enlarged distally, antennomere 5 nearly equilateral, following antennomeres distinctly transverse, slightly stouter in male than in female.

Pronotum 1.35–1.40 times as wide as long, widest near posterior angles, sides very slightly converging in approximately basal 1/2, then barely convexly more abruptly converging anteriorly. Anterior margin feebly bisinuate, bordered with thin entire sulcus. Posterior margin bisinuate, its median projection of moderate width with almost straightly truncated apex. Lateral carinae nearly straight, anteriorly reaching approximately to anterior 1/6 of pronotum, in view from above nearly completely visible. Disc of pronotum nearly regularly convex, flattened in front of scutellum. Macropunctures laterally coarse and dense, sparser and shallower in the middle. Micropunctures moderately dense, evidently denser and more distinct than on frons.

Scutellum transversely triangular with rounded lateral angles, with arcuate ledge separating convex anterior part with single micropunctures from flattened and microreticulated apical portion.

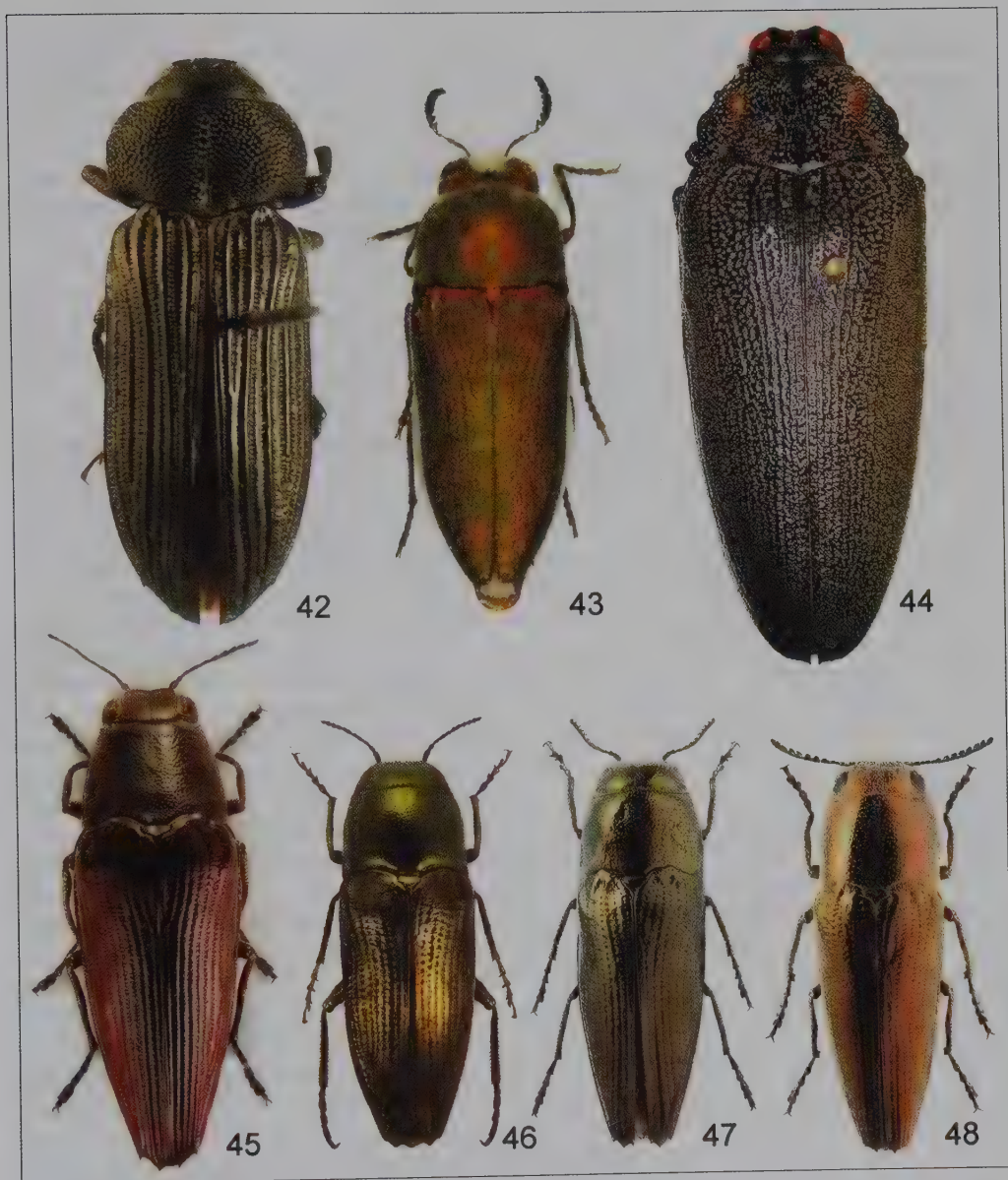
Elytra 2.0–2.05 times as long as wide, anteriorly slightly wider than pronotum, sides very slightly converging in basal 1/2–3/5, then more abruptly slightly arcuately converging to apices, which are tridentate, with lateral and sutural teeth sharp and narrow and medial tooth rather wide and nearly straight. Interstries anteriorly very slightly, posteriorly more strongly convex, odd interstries somewhat more elevated than even ones. Striae moderately deep with short hyphen-shaped punctures, laterally situated inside of rounded punctures, interstriae with irregular rows of small punctures. Micropunctures less distinct than those on pronotum but more distinct than on frons.

Prosternal process slightly convex, bordered by deep groove, with rather coarse and dense punctures like those on the remainder of sternum, punctuation slightly smoothed and become smaller in abdomen. Anal ventrite in male slightly shorter than in female, slightly arcuately truncate apically, in female apically rounded. Protibiae very slightly curved in both sexes, in male a little stronger, than in female, meso- and metatibiae nearly straight in both sexes.

Male genitalia as in Figure 6.

Ovipositor as in Figure 3.

Differential diagnosis: The new species is closely related to *Sphenoptera tantilla* Fåhraeus in Boheman, 1851, and *S. pusillima* Obenberger, 1926, from southern and eastern Africa respectively. Both species differs from the new one by absence of supraantennal keels, frons without any traces of elevations, punctuation of pronotum and elytra distinctly smaller but denser, in *S. pusillima* in lateral portion of pronotum somewhat fused into short irregular wrinkles. Sides of pronotum nearly parallel in posterior 2/3 (in *S. pusillima* slightly incurved near sharp posterior angles). Ovipositor with narrow medial plate dorsally. Males of both species were not studied.



Plates 42–48. 42: *Pseudocastalia arabica arabica* (Gestro, 1877), male, 16.9 mm, Djibouti, Gibdo (Photograph M.G. Volkovitsh); 43: *Paratassa orientalis* Bílý & Volkovitsh, 1996, female, 10.0 mm, UAE, Margham env.; 44: *Steraspis (Steraspis) speciosa arabica* Waterhouse, 1904, female, 45.0 mm, Oman, Taqah env.; 45: *Sphenoptera (Tropeopeltis) arabica* Gory, 1841, male, 15.0 mm, Yemen, Al Hudaydah; 46: *S. (T.) vanharteni* Kalashian nov. spec., male, holotype, 7.1 mm; 47: *S. (T.) vanharteni* Kalashian nov. spec., female, paratype, 7.2 mm (Photograph © K. Makarov); 48: *S. (Hoplistura) gnezdilovi* Kalashian nov. spec., male, holotype, 9.9 mm (Photograph © K. Makarov).

Host plant: Unknown.

Distribution: UAE.

Etymology: This species is named in the honour of Antonius van Harten, the leader of the "Arthropod Fauna of UAE" project.

***Sphenoptera (Hoplistura) gnezdilovi* Kalashian nov. spec.**

Plate 48, Figure 2

Specimens examined: Holotype: ♂ (ZIN), United Arab Emirates, Jebel Jibir, N25°38'14" E56°06'53", 1272 m, 8.iv.2010, V.M. Gnezdilov leg. Paratype: Wadi Hayl, N25°04'54" E56°13'32", 262 m, 11.iv.2010, V.M. Gnezdilov leg. (♂, MKCY).

Description: Body strongly elongate, 3.00–3.05 times as long as wide, rather strongly convex, bronze with slight reddish reflection. Surface shiny, without microreticulation, body dorsally nearly glabrous with single short setae at anterior portion of frons, sternum and pronotum with rather dense distinct setae laterally becoming sparser medially. Length 9.7–9.9 mm, width at base of elytra 3.2–3.3 mm.

Head broad, nearly as wide as anterior margin of pronotum. Eyes large, convex, distinctly projecting beyond outline of head, vertex 2.12–2.2 times as wide as transverse diameter of eye. Clypeus in shape of narrow semicircle with rounded apices, microreticulated. Frons with feebly sinuate sides very slightly converging posteriorly, nearly flat with rather distinct supraantennal keels not reaching inner margins of eyes. Frons with pair of very small and indistinct elevations medially at level of middle of eyes (in frontal view), macropunctures rather coarse and dense, slightly smoothed and becoming sparser medially and posteriorly. Micropunctures sparse, poorly visible. Antennae 2.25–2.35 times as long as eye height, serrate from antennomere 4, antennomere 3 elongate, slightly enlarged distally, antennomere 4 slightly longitudinal, following antennomeres moderately transverse.

Pronotum approximately 1.25 times as wide as long, widest slightly anterior of midlength or near anterior 2/5, its sides subparallel, slightly convexly converging anterior and very slightly posterior towards sharp posterior angles. Anterior margin bisinuate, bordered with entire sulcus. Basal margin bisinuate, its median projection of moderate width with almost straightly truncate apex. Lateral carinae developed in posterior 3/5, visible from above up to approximately midlength of pronotal sides. Pronotum nearly regularly moderately convex, flattened along middle line. Macropunctures of medium size, medially rather sparse, laterally condensed, partly fused into irregular transverse and oblique wrinkles; micropunctures dense, more distinct than in frons.

Scutellum transversely pentagonal, flattened or slightly convex, with rather numerous micropunctures.

Elytra 2.05–2.01 times as long as wide, distinctly wider than pronotal base, slightly obliquely narrowed to posterior 2/5, then more abruptly and slightly convexly to tridentate apices, with lateral and sutural teeth sharp and narrow and medial tooth rather wide, sharply obtuse-angled. Striae forming by thin hyphen-shaped punctures somewhere fused, interstriae anteriorly and medially nearly flat, laterally and posteriorly slightly convex, apically odd interstriae more elevated than even ones. Each interstria with irregular row of small macropunctures, laterally also with flat irregular wrinkles. Micropunctures small, poorly visible.

Prosternal process slightly convex, not bordered, with several large and coarse punctures, like those on remainder of sternum, on abdomen puncturation slightly smoothed. Anal ventrite truncate distally. Protibiae distinctly curved, with inner margin sinuate, mesotibiae slightly curved, with two large teeth on inner margin apically, metatibiae with similar teeth, nearly straight with inner margin distinctly sinuate.

Male genitalia as in Figure 2.

Female unknown.

Differential diagnosis: Closely related to *Sphenoptera nitens* Kerremans, 1898, known from Saudi Arabia and Egypt, *S. nubiae* Obenberger, 1924, from Egypt and *S. gossypicida* Obenberger, 1927, known from Sudan and Egypt. All three species differ from *S. gnezdilovi* nov. spec. by frons being distinctly bicolorous with anterior portion brightly metallic green, frons with pair of rather rough and large elevations, micropunctures of dorsal surface denser and more distinct, supraantennal keels in *S. gossypicida* weaker, in two other species more developed than in the new species. Pronotum in all three species distinctly and nearly regularly, somewhat arcuately widened towards posterior angles.

Host plant: Unknown.

Distribution: UAE.

Etymology: The new species is dedicated to the collector, V.M. Gnezdilov (ZIN).

***Sphenoptera (Chrysoblemma) cf. artemisiae* Reitter, 1889**

Plate 49

Specimen examined: Wadi Wurayah, N25°23' E56°16', 210m, 25.iii.2007, J. Batelka leg. (1 ex., JBCP).

Host plant: Unknown.

***Sphenoptera (Chrysoblemma) mirabilis* Kalashian nov. spec.**

Plate 50, Figures 4, 5

Specimens examined: Holotype: ♂ (NMPC), United Arab Emirates, N of Ajman, 5–16.vii.2008, water trap, A. van Harten leg. Paratype: N of Ajman, 16–23.vii.2008, water trap, A. van Harten leg. (♀, MKCY).

Description: Body moderately elongate, 2.65 (female) and 2.75 (male) as long as wide, strongly convex, nearly cylindrical, bronze, in male with greenish, in female with reddish reflection. Surface with rather dense short bright setae. Body length in male 6.1 mm, in female 8.2 mm, width 2.2 and 3.1 mm respectively.

Head large, barely narrower than anterior margin of pronotum, eyes large, in male convex, distinctly projecting beyond outline of head, in female slightly convex, barely projecting. Vertex about 2.8 times as wide as transverse diameter of eye in both sexes. Frons with sides very slightly diverging posteriorly, nearly regularly, moderately convex, flattened anterior-medially; supraantennal keels indistinct. Clypeus short, with slightly arcuately convex anterior margin. Macropunctures coarse, large and dense, somewhere adjoined, sculpture slightly smoothed posteriorly, micropunctures inconspicuous. Antennae serrated from antennomere 4, in male 1.9 times as long as eye height, antennomere 3 short, antennomere 4 slightly, following antennomeres strongly transverse, in female antennae 1.6 times as long as eye height, antennomere 3 rather elongate, antennomere 4 slightly longitudinal, antennomere 5 nearly equilateral, following antennomeres moderately transverse.

Pronotum 1.15–1.20 times as wide as long, widest slightly before middle, weakly convexly narrowed anteriorly and posteriorly, sides slightly emarginate behind posterior angles. Anterior margin bisinuate with strongly projecting medial lobe, not bordered, posterior margin slightly bisinuate with rather wide medial lobe. Lateral carinae very short, distinct only just anteriorly of posterior angles. Pronotum nearly regularly globose, flattened medially, surface with dense moderately large macropunctures, slightly smoothed and sparser medially, micropunctures rather dense but very small, hardly visible.

Scutellum transversely triangular with anterior margin arcuate, flattened, bearing single micropunctures.

Elytra in female 1.70, in male 1.85 times as long as wide, distinctly wider than base of pronotum, sides subparallel very slightly emarginate in anterior 2/3, then slightly convexly converging to tridentate apices, sutural and lateral teeth narrow, sharp, medial one wide,

unevenly obtuse-angled. Elytra convex, stria structure nearly completely concealing by rather coarse sculpture consisting of irregular transverse wrinkles and dense moderately large macropunctures. Micropunctures inconspicuous.

Prosternal process slightly convex, coarsely and densely punctured, bordered with entire narrow smooth elevation, remainder of sternum and abdomen with dense and coarse punctures slightly smoothed towards middle line and backwards. Anal ventrite slightly arcuately truncate in both sexes. Protibiae in male moderately, in female slightly curved, meso- and metatibiae nearly straight in both sexes.

Male genitalia as in Figure 4.

Ovipositor as in Figure 5.

Differential diagnosis: It seems that this quite distinct species have no close relatives. It shares some superficial similarity with the Mediterranean *Sphenoptera rotundicollis* Gory & Laporte, 1839, which can be easily distinguished by strong lateral keels of pronotum reaching its anterior 1/5–1/6, by much coarser macropunctures, inconspicuous pubescence of the dorsal surface and by distinctly convex odd elytral interstries.

Host plant: Unknown.

Distribution: UAE.

Etymology: The name is derived from Latin “*mirabilis*” (strange, wonderful) to emphasise the originality of the new species.

***Sphenoptera (Chrysoblemma) scovitzii alfierii* Obenberger, 1923**

Plate 53

Specimens examined: Um al-Quwain, N25°29'38" E55°33'22", 7.iv.2010, V.M. Gnezdilov leg., on *Tamarix nilotica* (1♂, 1♀). Ajman industrial area, 18.iv.2010, V. M. Gnezdilov, on *Tamarix nilotica* (2♂).

Additional specimens examined (not from the UAE): ISRAEL: Yeroham [“Palestine, Bir Rachma”], 6.vi.19.., on *Tamarix*, H. Bytinski-Salz leg. (2♂, NMPC); same locality but 1.vi. and 5.vii., on *Acacia* (2♂, NMPC). Beersheba, 14.vi.19.., *Polygonum*, H. Bytinski-Salz leg. (1♂, NMPC). Central Negev: Hamakhtesh Hagadol, Yeroham (12 km ESE), 8.vii.1996, on *Tamarix*, M.G. Volkovitsh & M. Yu. Dolgovskaya leg. (2 ex., ZIN). EGYPT: Ismailia (1♂, NMPC). SAUDI ARABIA: Eastern Province, Al Hasa, Arambo Farm, 19.xi.1981, D.A. Pitcher leg. (1♂, NMPC). ALGERIA: Beni Abbés env., Ougarta, 4.vi.1947, F. Pierre leg. (1♀, NMPC) (Plate 53), all V. Kubáň det.

Remarks: Described from Egypt (“Mead”). In the Palearctic catalogue (Volkovitsh & Kalashian, 2006) recorded from Egypt, Israel and Syria. Moreover, in the course of the study the additional specimens originated from Algeria and Saudi Arabia were found (NMPC) which are new records for these countries. Some of the specimens of this subspecies were determined by different specialists (J. Obenberger in coll.; Bílý, 1985, 1990) as *Sphenoptera dumonti* Théry, 1922. According to the description (Théry, 1922) this taxon is really similar to *S. s. alfierii*, but to clarify this question the study of type specimens of *S. dumonti* is necessary. *Sphenoptera dumonti* is distributed in Egypt, Algeria, Tunisia, and Saudi Arabia (Volkovitsh & Kalashian, 2006) and it develops in the wood of *Calligonum commosum* (Peyerimhoff, 1926).

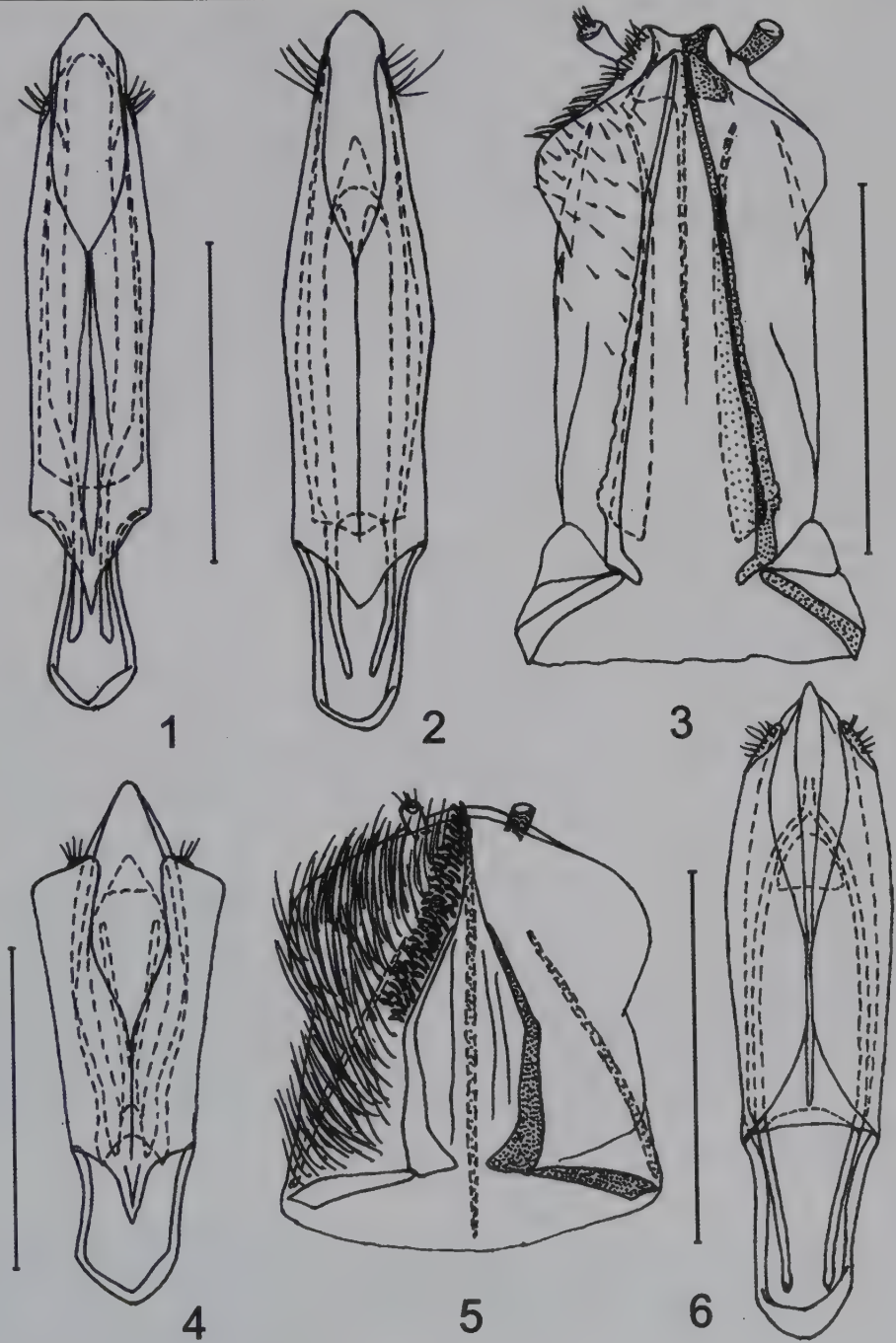
Host plant: Unknown. Nominotypic subspecies feeds in the roots of *Climacoptera* and *Salsola* (Chenopodiaceae) (Volkovitsh, 2004).

Distribution: Algeria, Egypt (incl. Sinai), Israel, Saudi Arabia, Syria, UAE. New species for the UAE, Algeria and Saudi Arabia.

***Sphenoptera (Deudora) schmideggeri* Kalashian nov. spec.**

Plate 51, Figure 1

Specimen examined: Holotype: ♂ (NMPC), United Arab Emirates, N of Ajman, 15–16.iii.2009, water trap, C. Schmid-Egger leg.



Figures 1–6. *Sphenoptera* spp. 1, 2, 4, 6: Male genitalia. 3, 5: Ovipositors. 1: *S. (Deudora) schmideggeri* Kalashian nov. spec.; 2: *S. (Hoplistura) gnezdilovi* Kalashian nov. spec.; 3, 6: *S. (Tropeopeltis) vanharteni* Kalashian nov. spec.; 4, 5: *S. (Chrysoblemma) mirabilis* Kalashian nov. spec. (Illustrations G. Karagyan.)

Description: Body moderately elongate, 2.6 times as long as wide, moderately convex, dark bronze with reddish reflection. Length 7.70 mm, width at base of elytra 2.95 mm.

Head moderately broad, slightly narrower than pronotum anteriorly, eyes large, moderately convex, slightly projecting beyond outline of head, vertex 2.15 times as wide as transverse diameter of eye. Clypeus in shape of narrow semicircle with rounded apices. Frons with sides barely diverging posteriad, nearly flat, with two pairs of distinct irregular elevations medially. Supraantennal keels distinct, not reaching inner margins of eyes. Macropunctures large, coarse and dense, slightly smoothed posteriorly, elevations with single punctures, micropunctures sparse, distinct only on elevations. Frons, besides reliefs glabrous, with rather dense short but distinct setae. Antennae 1.95 times as long as eye height, serrate from antennomere 4, antennomere 3 elongate, slightly enlarged distally, antennomere 4 very slightly, following antennomeres distinctly transverse.

Pronotum 1.45 times as wide as long, with sides nearly parallel in posterior 2/3, barely, convexly converging anteriad, posterior angles nearly straight. Anterior margin bisinuate, without bordering, posterior margin bisinuate with moderately wide median lobe. Lateral carinae nearly straight, reaching anterior 1/7, nearly entirely visible from above. Pronotum moderately convex with three longitudinal depressions – shallow median one and two deeper lateral depressions between midline and sides. Surface medially (on convex portion) with sparse rather coarse macropunctures, medial depression with punctures smaller and denser, lateral depressions with very dense coarse punctures, lateral sides with very coarse, partly asperate punctures sometimes fused into irregular wrinkles. Micropunctures rather distinct and dense. Pronotum with short setae, denser in depressions.

Elytra 1.9 times as long as wide, distinctly wider than pronotal base, with sides subparallel in anterior 3/5, than slightly convexly converging towards tridentate apices, sutural and lateral teeth narrow, sharp, medial one wide, unevenly obtuse-angled. Elytra moderately convex with odd interstries rather strongly convex, even ones nearly flat. Surface with rather coarse (especially laterally) irregular wrinkles, striae forming by hyphen-shaped punctures, laterally more or less concealing, interstries with irregular rows of small sparse macropunctures. Surface with short rather dense setae.

Prosternal process slightly impressed along the middle with dense puncturation, laterally of punctured area with nearly glabrous narrow stripes, then bordered with row of large punctures partly fused. Remainder of sternum and abdomen with dense punctures partly fused into irregular wrinkles, this sculpture slightly smoothed backwards, sternum and abdomen with dense setae condensed laterally. Metacoxae with two incisions – one medial and one near lateral angles. Anal ventrite truncate distally with lateral angles tooth-shaped. Protibiae distinctly curved, with inner margin sinuate, mesotibiae slightly curved, with two large teeth on inner margin apically, metatibiae with similar teeth, nearly straight with inner margin distinctly sinuate.

Male genitalia as in Figure 1.

Female unknown.

Differential diagnosis: Close to the Mediterranean species from the *Sphenoptera* (*Deudora*) *gemmata* Olivier, 1790 species-group (*S. gemmata*, *S. signata* Jakovlev, 1887, *S. vittaticolis* Lucas, 1844), but in all three species pronotum is rather regularly, somewhat arcuately widened posteriorly, sides of pronotum nearly continuing outline of elytra, protibiae in male less curved, macropunctures of the dorsal surface less dense and coarse, in *S. gemmata* and *S. signata* pronotum with poorly developed or absent longitudinal depressions, elytral interstries less convex, than in a new species. Besides this, the new species can be easily distinguished by the tridentate elytra (in all other species of the subgenus *Deudora* elytral

apices are more or less irregularly rounded, only occasionally with very small sutural tooth and the traces of lateral spine).

Host plant: Unknown.

Distribution: UAE.

Etymology: The new species is dedicated to its collector, C. Schmid-Egger (Berlin, Germany).

***Sphenoptera (Deudora) cf. parysatis* Obenberger, 1929**

Plate 52

Specimen examined: Ra's al-Jibal Mts., Jebel Jibir, N25°39'00" E56°07'20", 1380 m, 27.iii.2007, J. Batelka leg. (1 ex., NMPC), V. Kubán det.

Host plant: Unknown.

***Sphenoptera (Paradeudora) kermanshahensis* Obenberger, 1952**

Plate 54

Specimens examined: Wadi Yudayyah, N25°05'45" E55°47'05", 190 m, 18.iii.2007, J. Batelka leg. (1♀, JBCP; 1♀, NMPC) (Plate 54), V. Kubán det.

Additional specimens examined (not from the UAE): Western IRAN: Kermanshah Province: Kermanshah (1♂, syntype of *Sphenoptera (Paradeudora) kermanshahensis*, NMPC). IRAQ: Karbala, Nukhayab, 8.iv.1986, R. Linnavuori leg. (2 ex., MZHF; 1 ex., ZIN); Dhi Qar, Nasiriyah, Abu Ghar, 31.iii.1981, R. Linnavuori leg. (1 ex., MZHF), all M.G. Volkovitsh det. KUWAIT: Near Raudhatain, 16.iii.1981, R. Linnavuori leg. (4 ex., MZHF, 1 ex., ZIN), all M.G. Volkovitsh det. SAUDI ARABIA: "Arabia bor." (1♂, NMPC), V. Kubán det. Eastern Province: Ain Dar (8.5 km N), N26°03' E49°25', ca. 110 m, v.1975 (5 ex., MMUE), S. Bílý det. (Bílý, 1985); Ain Dar, N25°55' E49°20', v.1975, BM, 1979.439, D.A. Pitcher leg. (1 ex., MKCY), M.Yu. Kalashian det.. Near Nobak, 18.v.1978, R. Linnavuori leg. (2 ex., MZHF), M.G. Volkovitsh det. Eastern Province maritime: Al'Uqayr ["Uqair"] (19 km SE), v.1975, D.A. Pitcher leg. (1♂, NMPC), S. Bílý det. (Bílý, 1985). Central SYRIA: Ancient city Palmyra (W env.), 28.iv.1990, V. Kabourek leg. (1 ex., VKCZ), V. Kubán det.

Host plant: Unknown.

Distribution: Iraq, western Iran, Kuwait, northern and eastern Saudi Arabia, central Syria, UAE. New species for the UAE, Iraq, Kuwait and Syria.

Tribe *Dicercini* Gistel, 1848

Genus *Capnodis* Eschscholtz, 1829

***Capnodis excisa excisa* Ménétriés, 1848**

Plate 60

Remarks: Bílý (1985) recorded the nominotypic subspecies as new for Saudi Arabia (Eastern Province), subsequently Walker & Pittaway (1987) also for Kuwait (see also Howarth & Gillett, 2009). Howarth & Gillett (2009) recorded *Capnodis excisa excisa* as new for the UAE from Madam area, J.N.B. Brown leg. (1 ex. in the Abu Dhabi ENHG collection).

Host plants: *Calligonum* (Polygonaceae) (Volkovitsh & Alexeev, 1994).

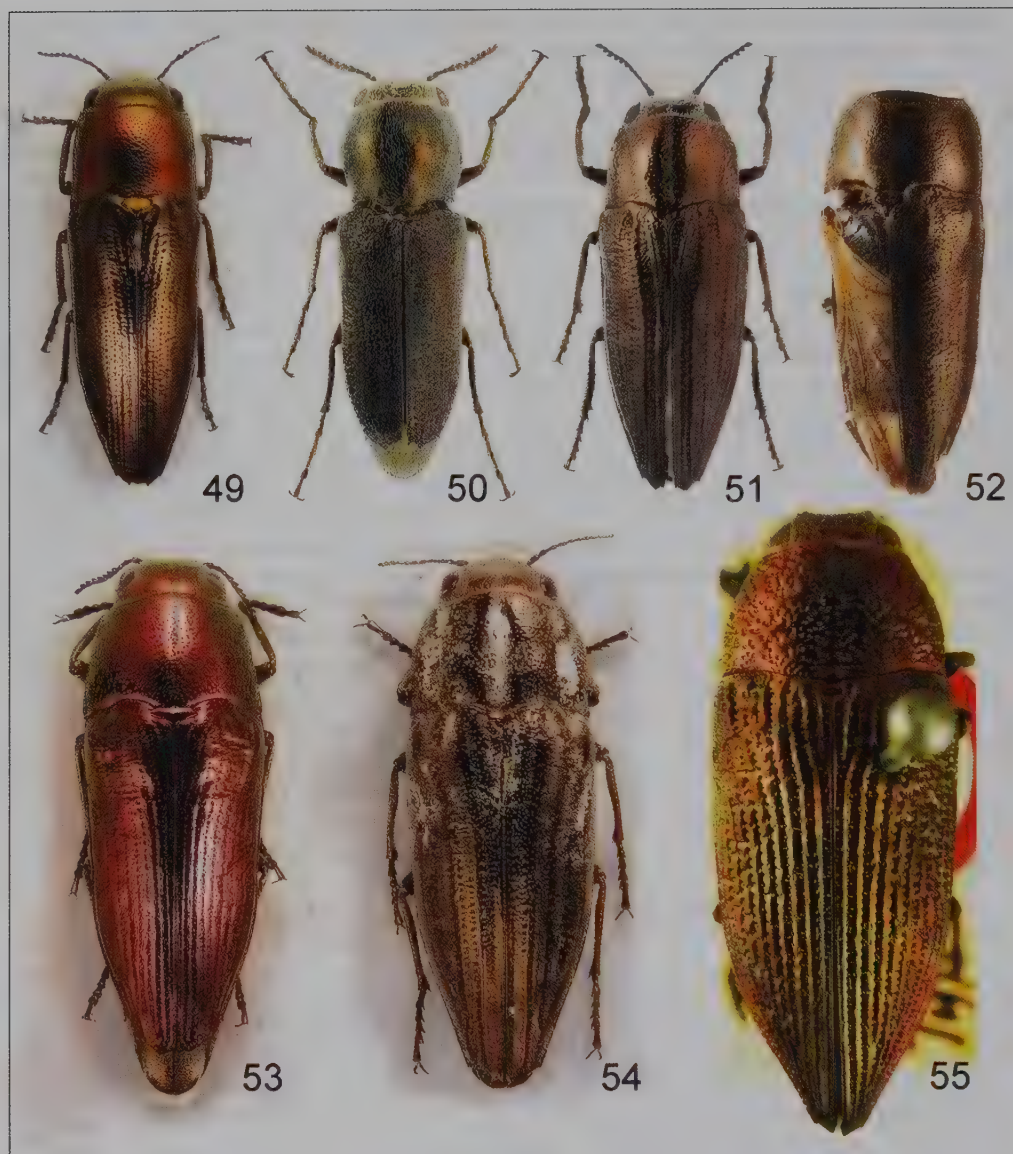
Distribution: Armenia, Azerbaijan, Iran, Iraq, Kazakhstan, Kuwait, eastern Saudi Arabia, Tadjikistan, Turkmenistan, northeastern Turkey, UAE, Uzbekistan.

***Capnodis excisa alfierii* Théry, 1929**

Plate 61

Specimens examined: OMAN: Wahiba Sands, near Wasil, N22°26' E58°45', 350 m, 25.x.1990, M.D. Gallagher leg. (1♀, NMPC). Wahiba Sands, near Mintirib, N22°26' E58°48', 350 m, 13.ii.1986, M.D. Gallagher leg. (1♀, NMPC) (Plate 61). Track desert, sands, near Mintirib, N22°05' E58°51', 240 m, 18.iii.1986, W. Büttiker leg. (2♂, NMPC).

Remarks: Blair (1931) described *Capnodis excisa* var. *aericolor* based upon two specimens from south eastern Saudi Arabia from Rub'al Khali desert (Hadh al Mazarig, 175 m, 17.i.1931, B. Thomas leg.). Kubán (2006) synonymized this taxon with *C. e. alfierii*, which



Plates 49–55. 49: *Sphenoptera* (*Chrysoblemma*) cf. *artemisiae* Reitter, 1889, 10.5 mm, UAE Wadi Wurayah; 50: *S.* (C.) *mirabilis* Kalashian nov. spec., male, holotype, 6.1 mm (Photograph © K. Makarov); 51: *S.* (*Deudora*) *schmideggeri* Kalashian nov. spec., male, holotype, 7.7 mm. (Photograph © K. Makarov.); 52: *S.* (*D.*) cf. *parysatis* Obenberger, 1929, 9.0 mm, UAE, Ra's al-Jibal Mts., Jebel Jibir; 53: *S.* (C.) *scovitzii alfierii* Obenberger, 1923, female, 16.0 mm, Algerien, Beni Abbés env., Ougarta; 54: *S.* (*Paradeudora*) *kermanshahensis* Obenberger, 1952, female, 14.0 mm, UAE, Wadi Yudayyah; 55: *Lampetis* (*Spinthoptera*) *arabica* (Gahan, 1895), 15.0 mm, syntype, Yemen, Hadhramaut.

was recorded only from southeastern Egypt, Sinai and Israel. From Oman Janikova recorded [no date] this species as "*Capnodis excisa aericolor*". The occurrence of this subspecies is possible in the southern portion of the UAE.

Host plants: *Calligonum commosum* (Polygonaceae) (Théry, 1929b; Volkovitsh, 2004).

Distribution: Southeastern Egypt (incl. Sinai), Israel, Oman, southeastern Saudi Arabia.

Genus *Lampetis* Dejean, 1833

Lampetis (Spinthoptera) arabica (Gahan, 1895)

Plate 55

Remarks: Recorded for the UAE by Gillett & Gillett (2005) and subsequently by Howarth & Gillett (2008, 2009) but we have not studied these specimens and this record cannot be accepted without a revision of specimens. So far only the type specimens of *Lampetis arabica* (BMNH) (Plate 55) are known. Accordingly to Kerremans (1910) also in Saudi Arabia (Jiddah) – unproven record.

Host plant: Unknown.

Distribution: Yemen (Hadramaut).

Lampetis (Spinthoptera) argentata (Mannerheim, 1837)

Plate 57

Remarks: Recorded for the UAE by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009). Bílý (1980, 1982, 1990) recorded this species from southwestern, central and northeastern Saudi Arabia. Described from Turkmenistan. Richter (1952) recorded *Lampetis argentata* from Central Asia, Transcaucasia and Iran, Volkovitsh & Alexeev (1994) also from Afghanistan, Iraq, Kazakhstan and Turkey. Accordingly to Krajčík (pers. comm.), the distribution reaches western Iraq (Syrian Desert). In collections and literature often confused with *L. mimosae* (Klug, 1829) (sensu lato). It is necessary to revise specimens from the Arabian Peninsula. The occurrence of this species in the UAE is rather doubtful.

Host plant: *Haloxylon*, *Kalidium*, *Salsola* (Amaranthaceae), *?Juglans* (Juglandaceae) (Volkovitsh & Alexeev, 1994).

Distribution: Afghanistan, Azerbaijan, Armenia, Iran, Iraq, Kazakhstan, Tadjikistan, Turkey, Turkmenistan, Uzbekistan.

Lampetis (Spinthoptera) catenulata catenulata (Klug, 1829)

Plate 58

Specimens examined: SUDAN: "Sudan aegp." (1♂, NMPC) (Plate 58). Southwestern YEMEN: Al Hudaydah E, Hammam Ali (2 km E), N14°40' E44°10', 1677 m, 12.iv.2007, P. Kabátek leg. (1♀, NMPC).

Howarth & Gillett (2009) recorded for UAE "*Psiloptera cf. catenulate* [sic!] (Klug)" (see below). The occurrence of *L. c. catenulata* in the UAE is rather questionable. This subspecies is widely distributed in the whole Saharian area and in the Sahel. From Saudi Arabia (Jiddah) recorded by Kerremans (1910) but from the text of this paper is clear that this record concerned *L. mimosae*. Kubáň (2006) recorded the nominotypic subspecies also from Yemen (see Material examined). The record from Oman (Kubáň, 2006) concerned *L. c. svobodai* Krajčík, 2009. In collections and in the literature often confused with *L. argentata* (e.g. Kerremans, 1910; Jakobson, 1913) or under the name "*rugosa*" (e.g. Kerremans, 1908) [not *L. rugosa* (Palisot de Beauvois, 1807)]. Data on the distribution of *L. c. catenulata* in Afghanistan, Iraq, Turkmenistan and "Transcaspiya" (Bellamy, 2008) concerned *L. argentata*.

Host plant: Unknown.

Distribution: Chad, Egypt, ?Saudi Arabia, Senegal, Somalia, Sudan, Tunisia, Yemen.

***Lampetis (Spinthoptera) catenulata svobodai* Krajčák, 2009**

Plate 59

Specimens examined: Southern OMAN: Dhofar Province: road Mirbat–Sadh 4.viii.1999, R. Červenka leg. (2♂, holotype and paratype of *Lampetis catenulata svobodai*, NMPC) (Plate 59); same data but: viii.1999, S. Jákł leg. (2♂, NMPC); Taqah, 20 m, viii.1999, S. Jákł leg. (1♂, NMPC); Road Taqah–Mirbat, 12 km, 50–200 m, 3.viii.1999, R. Červenka leg. (1♂); Mirbat, Wadi Ayn Hilf, 7.ix.2000, D. Gianasso leg. (1♂); Wadi Mughsayl, 6–8.ix.2007, N16°54'41" E53°45'45", 30 m, J. Horák leg. (1♂); all paratypes of *L. c. svobodai*.

Remarks: Howarth & Gillett (2009) recorded from the UAE “*Psilopectera* cf. *catenulata* [sic!] (Klug)”. This record most probably concerns *L. c. svobodai* which was described quite recently from southern Oman (Krajčák, 2009). The record of *L. c. catenulata* from Oman (Kubáň, 2006) concerned *L. c. svobodai*. The occurrence of this subspecies in the northern part of the UAE is highly possible.

Host plant: *Acacia* (Fabaceae) (field observation from Oman, J. Horák, pers. comm.).

Distribution: Southern Oman (Dhofar).

***Lampetis (Spinthoptera) mimosae mimosae* (Klug, 1829)**

Plate 56

Specimens examined: Mushrif Park, N25°17' E55°28', 25.ii.2006, A. van Harten leg., hand coll. (1♂). Al-Jazirat al Hamra (7 km S), N25°40' E55°45', 27.ii.2006, A. van Harten, hand coll. (1♂). S of Ra's al-Khaimah, N25°43' E55°52', 6.iv.2008, J. Bosák leg., hand coll. (1♂). Ra's al-Khaimah Airport (10 km SW), 19.iii.2009, C. Schmid-Egger leg. (1ex., SECB). Sharjah Desert Park, N25°17' E55°42', 19–22.iii.2008, A. van Harten leg., hand coll. (1♂) (Plate 56).

Recorded as a new species for UAE by Gillett & Gillett (2005) and subsequently by Howarth & Gillett (2008, 2009).

Host plants: *Zygophyllum* (Zygophyllaceae), ?*Balanites* (Zygophyllaceae), *Calligonum commosum* (Polygonaceae), *Casuarina cunninghamiana* (Casuarinaceae), *Prosopis farcta* (Fabaceae), *Tamarix* (Tamaricaceae) (Bytinski-Salz, 1954; Halperin & Argaman, 2000; Lotte, 1943; Volkovitsh, 2004). Larva develops in the semi-dead wood of various broad-leaved trees, mainly *Acacia* (Fabaceae).

Distribution: Algeria, Chad, Djibouti, Egypt, Eritrea, Ethiopia, Greece, Iran, Israel, Jordan, Lebanon, Libya, Morocco, Oman, Saudi Arabia, Senegal, Sudan, Syria, Tanzania, Tunisia, Turkey, UAE, Yemen.

Subfamily **Buprestinae** Leach, 1815

Tribe **Anthaxiini** Gory & Laporte, 1938

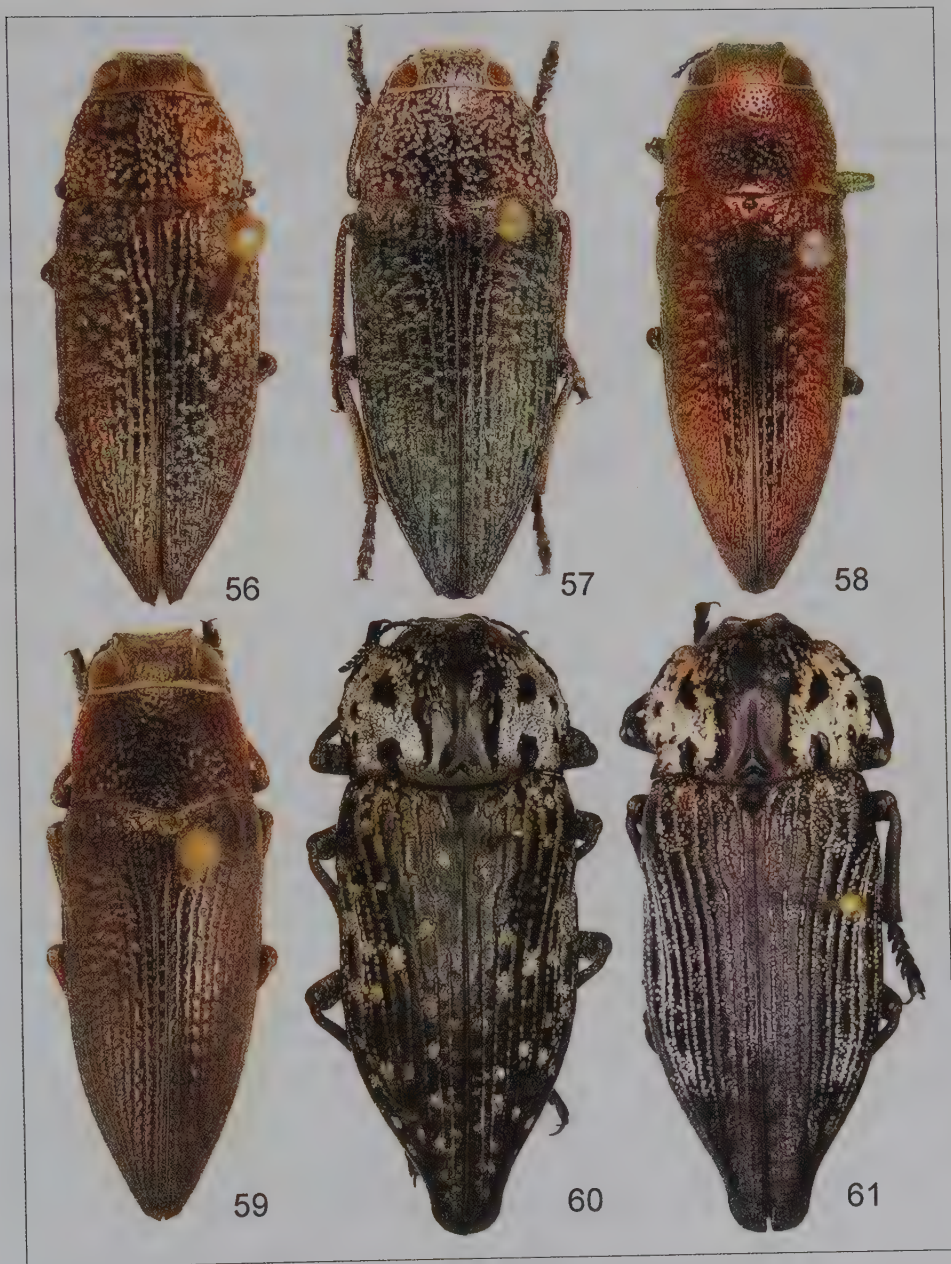
Genus **Anthaxia** Eschscholtz, 1829

***Anthaxia (Haplanthaxia) abdita* Bílý, 1982**

Plate 62

Specimens examined: Ar-Rafah, N25°43' E55°52', 17.iv.2010, K. Mahmood leg., hand coll. (1♂). Jebel Jibir, N25°38'14" E56°06'53", 26.ix–9.x.2010, A. van Harten leg., water trap (3♂, 2♀). Mountain valley near Khor Kalba (tunnel), N24°58'50" E56°10'07", 11.iv.2010, V.M. Gnezdilov leg. (1♂). Wadi Shawkah, N25°06' E56°01', 1–7.iv.2007, A. van Harten leg., water trap (3♂, 1♀); 305 m, 10.iv.2010, V.M. Gnezdilov leg. (1♂); Wadi Shawkah, N25°06'14" E56°02'49", 300 m, 20.iii.2007, F. Menzel leg. (1♀). Wadi Tarabat, N24°08' E55°45', 13.iv.2010, K. Mahmood leg., hand coll. (1♂) (Plate 62).

Additional specimens examined (not from the UAE): EGYPT: South Sinai: Mt. Catherine (40 km NE), Gebel Cunna, 24.ii.1998, *Acacia* sp., ex larva, 20.viii.1998, D. Baiocchi leg. (1♂, NMPC). Southern JORDAN: Ma'a'n (50 km SE), 1100 m, vii–x.1994, *Acacia* sp., ex larva, N29°59' E35°56', S. Bečvář jr. & sen. (1♂, 1♀, NMPC). YEMEN: Sana'a, Wadi Dhahr, 29–31.v.1987, H. Mühle leg. (6♂, 2♀, NMPC, VKCB). Sana'a env., Bait Bows dam, 2300 m, 30.v.2010, N15°16'24" E44°11'38", V. Hula & J. Niedobová leg. (9♂, 5♀, NMPC).



Plates 56–61. 56: *Lampetis (Spinthoptera) mimosae mimosae* (Klug, 1829), female, 15.0 mm, UAE, Sharjah Desert Park; 57: *L. (S.) argentata* (Mannerheim, 1837), male, 17.0 mm, Turkmenistan, Mt. Uly Balkan, Hauser leg. 1898 (NMPC); 58: *L. (S.) catenulata catenulata* (Klug, 1829), male, 19.0 mm, "Sudan aegp." (NMPC); 59: *L. (S.) c. svobodai* Krajčik, 2009, male, paratype, 17.0 mm, Oman, road Taqah–Mirbat, 12 km; 60: *Capnodis excisa excisa* Ménétriés, 1848, male, 29.0 mm, Iran, Hormozgan, 16 km N of Jask (NMPC); 61: *C. e. alfieri* Théry, 1929, female, 32.0 mm, Oman, Wahiba Sands, near Mintirib.

First recorded from the UAE by Gillett & Gillett (2005), subsequently by Howarth & Gillett (2008, 2009).

Host plant: *Acacia*, *Prosopis farcta* (Fabaceae), *Ficus carica* (Moraceae) (Halperin & Argaman, 2000; Volkovitsh, 2004).

Distribution: Egypt (Sinai), Israel, Jordan, Oman, Saudi Arabia, UAE, Yemen. New species for Sinai and Yemen.

***Anthaxia (Haplanthaxia) pinda* Bílý & Baiocchi, 2009**

Plate 66

Specimens examined: Wadi Wurayah, N25°23' E56°16', 210 m, reared from dead twigs of *Nerium oleander*, emerged on iv.2007, J. Batelka leg. (4♂, 5♀) (Plate 66); reared from dead twigs of *Nerium oleander*, emerged on 14.vii.2007, J. Batelka leg. (3♂, 1♀); reared from dead twigs of *Nerium oleander*, emerged on 29.vi.2007, J. Batelka leg. (6♂, 3♀).

Described by Bílý & Baiocchi (2009) – holotype and 13 paratypes from UAE, 23 paratypes from Oman.

Host plant: *Nerium mascatense*, *N. oleander* (Apocynaceae), *Moringa peregrina* (Moringaceae) (Bílý & Baiocchi, 2009).

Distribution: Oman, UAE.

***Anthaxia (Haplanthaxia) roxana* Bílý, 1983**

Plate 63

Specimens examined: Sharjah, N25°21' E55°24', 28.vi–16.vii.2005, A. van Harten leg., light trap (1♂). Al-Ajban, N24°36' E55°01', 9.iv–2.v.2006, A. van Harten leg., Malaise trap (1♀); 24.iv–2.v.2006, A. van Harten leg., Malaise trap (1♂, 2♀); 6–22.v.2006, A. van Harten leg., light trap (1♂, 3♀); 15–22.v.2006, A. van Harten leg., Malaise trap (2♀); 12–19.vi.2006, A. van Harten leg., Malaise trap (1♂); 19–26.vi.2006, A. van Harten leg., Malaise trap (1♂, 2♀).

Additional specimens examined (not from the UAE): Southern IRAN: Hormozgan Province: Bandar-e-Abbas (62 km E), Hasan Langi, 26.vi.2002, S. Kadlec leg. (1♂, 1♀, NMPC) (Plate 63). Sistan and Baluchestan Province: Bampur, *Acacia* sp., ex larva, 1996, M. Kafka leg. (many ex., MKCN, NMPC, VKCB). Southern PAKISTAN: Baluchistan Province: Kuzdar District, Awaran, 4–7.iv.1993, *Acacia* sp., ex larva, v.1993, S. Bečvář leg. (1♀, VKCB). Sind Province: Kirthar National Park, Karchat, 2–4.iii.1995, D. Hauck & L. Čížek leg. (1♂, 1♀, VKCB).

Host plant: *Acacia* (Fabaceae) (new record).

Distribution: Iran, Pakistan, UAE. New species for the UAE.

***Anthaxia (Haplanthaxia) semiramis* Obenberger, 1914**

Plate 64

Specimens examined: Ajman industrial area, 13.iv.2010, V.M. Gnezdilov leg. (1♂, 1♀). Al-Ajban, N24°36' E55°01', 25.ii–19.iii.2006, A. van Harten leg., Malaise trap (3♂); 19–27.iii.2006, A. van Harten leg., Malaise trap (2♂, 1♀); 25.iii–2.iv.2006, A. van Harten leg., Malaise trap (4♂, 1♀) (Plate 64); 1–8.iv.2006, A. van Harten leg., Malaise trap (5♂, 3♀); 2–9.iv.2006, A. van Harten leg., Malaise trap (9♂); 9.iv–2.v.2006, A. van Harten leg., Malaise trap (1♂); 9–16.iv.2006, A. van Harten leg., Malaise trap (2♂, 3♀); 17–24.iv.2006, A. van Harten leg., Malaise trap (5♂, 13♀); 24.iv–2.v.2006, A. van Harten leg., Malaise trap (7♂, 2♀); 17.iv.2010, V.M. Gnezdilov leg. (2♂). Wadi Bih (dam), 22–23.iii.2009, A. van Harten leg., water trap (2♂). Wadi Wurayah farm, 19.iv–18.v.2008, A. van Harten leg., Malaise trap (1♂).

Additional specimens examined (not from the UAE): Central SYRIA: Palmyra (60 km N), Jabal Abu Rujman, 23.iv.2001, reared from *Acacia* sp., O. Mehl leg. (4♂, NMPC).

Host plant: *Acacia* (Fabaceae) (new record).

Distribution: Iraq, Israel, Syria, UAE. New species for the UAE.

Anthaxia (Haplanthaxia) spec.

Plate 65

Specimens examined: Jebel Jibir, N25°39' E56°07', 8.iv.2010, K. Mahmood leg., hand coll. (1♀).

Host plant: Unknown.

Tribe **Melanophilini** Bedel, 1921Genus **Melanophila** Eschscholtz, 1829**Melanophila cuspidata** (Klug, 1829)

Plate 67

Specimens examined: NARC, near Sweihan, N24°24' E55°28', 30.iv–11.v.2005, A. van Harten, light trap (1♀) (Plate 67).

Host plants: *Cupressus*, *Juniperus* (Cupressaceae), *Elaeagnus* (Elaeagnaceae), *Ficus* (Moraceae), *Phyllirea* (Oleaceae), *Pinus* (Pinaceae), *Pistacia* (Anacardiaceae), *Populus*, *Salix* (Salicaceae), *Quercus* (Fagaceae), *Spartium* (Fabaceae), *Ulmus* (Ulmaceae) (Richter, 1952; Volkovitsh & Alexeev, 1994; Curletti, 1994). *Tamarix* (Tamaricaceae) (Halperin & Argaman, 2000; Turkmenistan, Ashgabat, V. Kubáň, in litt.). Widely polyphagous species on broad-leaved trees and shrubs with the preference for partially burned wood.

Distribution: Afghanistan, Albania, Algeria, Armenia, Azerbaijan, Bosnia-Herzegovina, Bulgaria, Chad, Croatia, Cyprus, Egypt, Ethiopia, France, Georgia, Greece, Iran, Iraq, Israel, Italy, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Libya, Macedonia, Malta, Morocco, Nigeria, Portugal, Romania, Senegal, Slovenia, Spain, Sudan [type locality], Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, UAE, Uzbekistan, former Yugoslavia. New species for the UAE.

Tribe **Chrysobothrini** Gory & Laporte, 1938Genus **Chrysobothris** Eschscholtz, 1829**Chrysobothris (Chrysobothris) parvipunctata** Obenberger, 1914

Plate 68

Specimens examined: Wadi Wurayah, N25°24' E58°17', 25.iv–2.v.2007, A. van Harten leg., Malaise trap (1♂, 2♀); 11–18.v.2007, A. van Harten leg., Malaise trap (2♂, 1♀). Wadi Bih (dam), N25°48' E58°04', 9–23.vii.2008, A. van Harten leg., light trap (2♀); 24.iv–1.v.2007, A. van Harten leg., light trap (1♂, 1♀); 2–4.iv.2009, A. van Harten leg., water trap (1♀); 30.iv–4.vi.2008, A. van Harten leg., light trap (1♀). Al-Ajban, N24°36' E55°01', 9.iv–2.v.2006, A. van Harten leg., Malaise trap (1♀). Additional specimens examined (not from the UAE): AFGHANISTAN: Kandahar Province: Kandahar, vii.1956, J. Sedláček leg. (1♀, VKBC). Northwestern INDIA: Rajasthan State: Fatehpur, 17.x.1989 (1 ex., ZIN), Jodhpur, 18.ix., 20.ix., 3.xii.1989, 2.ii.1990 (7 ex., ZIN), all reared from *Acacia senegal*, A.V. Kompantsev leg. IRAN: Hormozgan Province: Minab (15 km S), 26.iv.2002, P. Kabátek leg. (1♂, NMPC) (Plate 68); Minab (12 km NW), Shahvar, N27°14' E57°01', 18–19.v.1973, loc. no. 202, Exp. Nat. Mus. Praha (1♀, NMPC) [see also Bílý (1983), as *Chrysobothris beesoni beesoni*]. Kerman Province: Rafsanjan, 1500 m, 20.v.2004, reared from *Pistacia*, H. Hashemi Rad leg. (1♂, 1♀, VKCB). Kohgiluyeh and Boyer-Ahmad Province: Sisakht, Zagros Mts., 2400 m, 13+15.vi.1973, loc. no. 240, Exp. Nat. Mus. Praha (1♂, NMPC) (see also Bílý, 1983). Qom Province: Qom [“Ghom”], 12.vi.1991, light trap, M. Abai leg. (1♀, VKCB). Sistan and Baluchestan Province: Bampur (1♂, NMPC); Khash, D.M. Shteinberg (1 ex., ZIN). Tehran Province: Tehran, on *Prunus persica* (1♂, NMPC). IRAQ: Abu Ghraib, 7.ix.1969, reared from *Malus domestica*, J. Kheiri leg. (1♂, holotype of *C. beesoni kheirii* Cobos, 1970, MNMS). Baghdad (85 km SSW), Karbala [“Arabia Kerbela”] (1♂, syntype of *C. parvipunctata*, NMPC). Mosul, vii.1968, reared from *Pistacia vera*, H.E. Knopf leg. (1♂ 1 ♀, NMPC). Tall Afar, 23.vi.1969, reared from *Malus domestica*, H.E. Knopf leg. (1♀, NMPC). PAKISTAN: Punjab Province: Lahore, 2–14.vi.1919, reared from *Prosopis spicigera*, R.N. Parker leg. (3♂, 2♀, syntypes of *C. beesoni* Obenberger, 1928, NMPC). Sind Province: Kirthar National Park, Karchat, 25.ii–4.iii.1995, D. Hauck & L. Čížek leg. (2♂, VKCB). TURKMENISTAN: Ashgabat, Sovety Azerbaijana vill., 6.v.1991, N. Alexeev leg. (3♂, ZIN), A.V. Alexeev det. (2), W. Barries det. (1); same data but: 5.v.1988, reared in the laboratory 6.vii.1988 (1♀, ZIN), A.V. Alexeev det.; same data but: reared in the laboratory 30.vi.1988 (1♂, ZIN). Ashgabat Region, Badghyz, Kerlek vill.,



Plates 62–67. 62: *Anthaxia (Haplanthaxia) abdita* Bílý, 1982, male, 3.5 mm, UAE, Wadi Tarabat; 63: *A. (H.) roxana* Bílý, 1983, female, 4.2 mm, Iran, Hormozgan, 62 km E of Bandar-e-Abbas; 64: *A. (H.) semiramis* Obenberger, 1914, male, 5.5 mm, UAE, al-Ajban; 65: *Anthaxia (Haplanthaxia)* spec., female, 3.0 mm, UAE, Jebel Jibir; 66: *A. (H.) pinda* Bílý & Baiocchi, 2009, male, 6.0 mm, UAE, Wadi Wurayah; 67: *Melanophila cuspidata* (Klug, 1829), female, 12.0 mm, UAE, NARC, near Sweihan.

11.vi.1955, flying on *Pistacia vera* ["fistashka"], A.L. Znamenskaya leg.; same data but: 23–25.vii.1955, from *Pistacia* branches (4), reared from *Pistacia* in the laboratory (2) (3♂, 3♀, ZIN in coll. V.N. Stepanov); same data but: 14.vii.1955, found in the *Pistacia* trunk (1♂, ZIN in coll. V.N. Stepanov); Kushka, Morgunovskii vill., 16.vi.1953, N.G. Lymar' leg. (1♂, ZIN in coll. V.N. Stepanov). First recorded from the UAE by Gillett & Howarth (2004), subsequently also by Gillett & Gillett (2005) and Howarth & Gillett (2008, 2009).

Host plant: *Acacia senegal* (Fabaceae) (new record); *Malus domestica* (Rosaceae) [Cobos (1970), holotype and 5 paratypes of *C. besoni kheirii*]; *Pistacia* (Anacardiaceae), larvae under the bark of dying twigs [C. Holzschuh, pers. comm., Iran, Kerman]; *Pistacia vera* (Anacardiaceae) (new record); *Prosopis cineraria* (Fabaceae) [Obenberger (1928), syntypes of *C. besoni*, as *Prosopis spicigera*]; *Prunus persica* (Rosaceae) (new record); *Punica* (Lythraceae) [Borumand (2002), Iran: Yazd].

Distribution: Afghanistan (Bily, 1972; Alexeev et al., 1991; new record), India (new record), Iran (Semenov & Richter, 1934; Bily, 1983; Borumand, 2002; new record), Iraq (Obenberger, 1914; Cobos, 1970 [type localities]; new record), Pakistan (Obenberger, 1928; new record), Turkmenistan (new record), UAE (Gillett & Howarth, 2004; new record). New species for India and Turkmenistan.

Subfamily **Agrilinae** Laporte, 1835

Tribe **Coraebini** Bedel, 1921

Genus **Clema** Semenov, 1900

Clema deserti deserti Semenov, 1900

Plate 69

Specimen examined: Sharjah Desert Park, N25°16'52" E55°41'25", 10.iv.2010, V.M. Gnezdilov leg. (1 ex., ZIN) (Plate 69).

Additional specimens examined (not from the UAE): Northern China, Gobi Desert, Coll. Hauser (1 ex., NHMB).

Host plant: *Aristida* (Poaceae) (Volkovitsh & Alexeev, 1994).

Distribution: Northern China, Iran, Kazakhstan, Uzbekistan, Turkmenistan. New species for the UAE and China.

Tribe **Agrilini** Laporte, 1835

Genus **Agrilus** Curtis, 1825

Agrilus (Agrilus) yemenita Curletti & van Harten, 2002

Plate 70

Specimens examined: Fujairah, N25°08' E56°21', 10–17.vi.2006, A. van Harten leg., water trap (1♀).

Host plant: Most probably *Acacia* (Fabaceae) (Curletti & van Harten, 2002).

Distribution: UAE, Yemen. New species for the UAE.

Agrilus (Diplolophotus) desertus (Klug, 1829)

Plate 71

Specimens examined: Al-Ajban, N24°36' E55°01', 2–22.xi.2006, A. van Harten leg., Malaise trap (1♂). Sir Bani Yas, N24°19' E52°35', 23–25.ix.2009, B. Howarth, Malaise trap (1♀), Wadi Wurayah (farm), N25°23' E56°19', 2–19.iii.2009, A. van Harten leg., Malaise trap (1♂) (Plate 71).

Host plant: *Acacia raddiana*, *A. flava* (Fabaceae) (Mateu, 1972).

Distribution: Algeria, Chad, Djibouti, Egypt, Iran, Israel, Jordan, Morocco, Saudi Arabia, Tunisia, UAE, Yemen. New species for the UAE.

***Agrilus (Micragrilus) lituratus* (Klug, 1829)**

Plate 72

Specimens examined: Al-Ajban, N24°36' E55°01', 24.iv–2.v.2005, A. van Harten leg., Malaise trap; 25.iii–2.iv.2006, A. van Harten leg., Malaise trap; 2–9.iv.2006, A. van Harten leg., Malaise trap; 9–16.iv.2006, A. van Harten leg., Malaise trap; Sharjah, N25°21' E55°24', 23–24.v.2005, A. van Harten leg., Malaise trap (together 27 ex., CCIT). Al-Ajban, N24°36' E55°01', 16–23.vii.2005, A. van Harten leg., Malaise trap (6♂, 4♀); 1–8.iv.2006, A. van Harten leg., Malaise trap (6♂, 7♀); 17–24.iv.2006, A. van Harten leg., Malaise trap (1♂, 3♀). Sharjah, N25°21' E55°24', 16–23.vii.2005 (2♂). Khor Kalba, near tunnel, 3–18.v.2006, A. van Harten leg., light trap (1♀) (Plate 72).

Host plant: *Acacia flava*, *A. raddiana*, *A. seyal* (Fabaceae) (Mateu, 1972).

Distribution: Algeria, Chad, Egypt, Iran, Israel, Jordan, Libya, Mauritania, Morocco, Saudi Arabia, Senegal, Sudan, Tunisia, UAE, Yemen. New species for the UAE.

Tribe Aphanisticini Jaquelin du Val, 1863**Genus *Aphanisticus* Latreille, 1810*****Aphanisticus bedeli* Abeille de Perrin, 1893**

Plate 73

Specimens examined: Khor al-Khwair, N25°57' E56°03', 16–23.v.2007, A. van Harten leg., light trap (1♂).

Additional specimens examined (not from the UAE): ALGERIA: Ghardaia: 2.v.1987, on *Cymbopogon schoenanthus* (L.), V. Kubáň and S. Bílý leg. (ca. 15 ex., NMPC, VKCB); same data but 15.–16.iv.1988, V. Kubáň leg. (ca. 20 ex., VKCB) (Plate 73).

Host plant: *Cymbopogon schoenanthus* (Poaceae) (new record).

Distribution: Algeria, Tunisia, UAE. New species for the UAE.

Tribe Trachyini Laporte, 1835**Genus *Trachys* Fabricius, 1801*****Trachys erythrae* Obenberger, 1937**

Plate 74

Specimens examined: Wadi Bih (dam), N25°48' E56°04', 29.iii.2007, A. van Harten leg., sweeping (1♀); 29.vi–8.vii.2008, A. van Harten leg., light trap (1♀); 9–23.vii.2008, A. van Harten leg., light trap (1♂) (Plate 74); 16.xii.2009–8.iii.2010, A. van Harten leg., water trap (1♀).

Host plant: Unknown.

Distribution: Eritrea, UAE. New species for the UAE.

***Trachys latifrons* Kerremans, 1907**

Plate 75

Specimens examined: Sharjah Desert Park, N25°17' E55°42', 6–28.xii.2006, A. van Harten leg., pitfall trap (1♀). Bithnah, N25°11' E56°14', 19.x–16.xi.2006, A. van Harten leg., Malaise trap (1♀). Sharjah, N25°21' E55°24', 1–14.xi.2010, A. van Harten leg., water trap (1♂, 3♀). Wadi Bih (dam), N25°48' E56°04', 29.iii.2007, A. van Harten leg., sweeping (1♂); 2–4.iv.2009, A. van Harten leg., water trap (1♂, 1♀); 1–19.i.2010, A. van Harten leg., water trap (1♂); 13.xiii.2009–8.iii.2010, A. van Harten leg., water trap (2♂) (Plate 75); 16.xii.2009–8.iii.2010, A. van Harten leg., water trap (1♂). Wadi Hayl, N25°05' E56°13', 17.iv.2010, K. Mahmood leg., hand coll. (1♀). Wadi Maidaq, N25°18' E56°07': 27.vi–29.vii.2006, A. van Harten leg., Malaise trap (1♀); 27.vi–29.viii.2006, A. van Harten leg., Malaise trap (1♂); Wadi Shawkah, N25°06' E58°03', 19–28.xi.2007, A. van Harten leg., sample trap (1♀).

Additional specimens examined (not from the UAE): Southwestern SAUDI ARABIA: Abha to Jizan, km 53, Wadi Ad Dilla, 300 m (1 ex., NHMB).

Host plant: Unknown.



Plates 68–77. 68: *Chrysobothris* (*Chrysobothris*) *parvipunctata* Obenberger, 1914, male, 11.0 mm, Iran, Hormozgan, 15 km s of Minab (NMPC); 69: *Clema deserti deserti* Semenov, 1900, 4.6 mm, UAE, Sharjah Desert Park (Photograph M.G. Volkovitsh); 70: *Agrilus* (*Agrilus*) *yemenita* Curletti & van Harten, 2002, male, 5.0 mm, Yemen, Lahj; 71: *A. (Diplophotus) desertus* (Klug, 1829), male, 7.5 mm, UAE, Wadi Wurayah (farm); 72: *A. (Micragrilus) lituratus* (Klug, 1829), female, 3.5 mm, UAE, Khor Kalba; 73: *Aphanisticus bedeli* Abeille de Perrin, 1893, male, 4.0 mm, Algeria, Ghardaia; 74: *Trachys erythrae* Obenberger, 1937, male, 2.5 mm, UAE, Wadi Bih (dam); 75: *T. latifrons* Kerremans, 1907, male, 2.3 mm, UAE, Wadi Bih (dam); 76: *Trachys* nr. *bodenheimeri* Théry, 1934, male, 2.0 mm, UAE, Sharjah Desert Park; 77: *T. nr. bodenheimeri* Théry, 1934, female, 2.0 mm, UAE, Wadi Shawkah.

Distribution: Eritrea, Ethiopia, southwestern Saudi Arabia, Sudan, UAE, Yemen. New species for the UAE.

Trachys nr. *bodenheimeri* Théry, 1934

Plates 76–77

Specimens examined: Sharjah Desert Park, N25°17' E55°42', 25.ii–5.iii.2006, A. van Harten leg., light trap (1♂) (Plate 76). Wadi Bih (dam), N25°48' E56°04', 16.xii.2009–8.iii.2010, A. van Harten leg., water trap (1♂). Wadi Shawkah, N25°06' E56°02', 250–280 m, 20–23.iii.2007, pan traps, J. Batelka leg. (1♀, JBCP) (Plate 77); Wadi Shawkah, N25°06' E58°03', 31.x–27.xi.2006, A. van Harten leg., water trap (1♂); 20–26.iii.2007, A. van Harten leg., sweeping (1♂); 1–7.iv.2007, A. van Harten leg., sweeping (1♂, 1♀); 5–12.v.2007, A. van Harten leg., water trap (3♂, 2♀); 19–22.v.2007, A. van Harten leg., water trap (1♂, 1♀); 25.x–15.xi.2007, A. van Harten leg., water trap (1♂). Wadi Wurayah farm, 19.iv–18.v.2009, A. van Harten leg., Malaise trap (1♂, 1♀).

Additional specimens examined (not from the UAE): OMAN: Dhofar Province: Salalah (20 km NE), Wadi Nashib, 25–26.ix.2008, S. Jákl leg. (1 ex., NMPC). YEMEN: Sana Province: Manakhah (12 km NW), 23.vi–6.viii.2003, A. van Harten leg., Malaise trap (2 ex., NMPC). Lahj Province: Lahj, 15–30.vi.2001, A. van Harten leg., Malaise trap (1 ex., NMPC).

Host plant: Unknown.

Distribution: Oman, UAE, Yemen.

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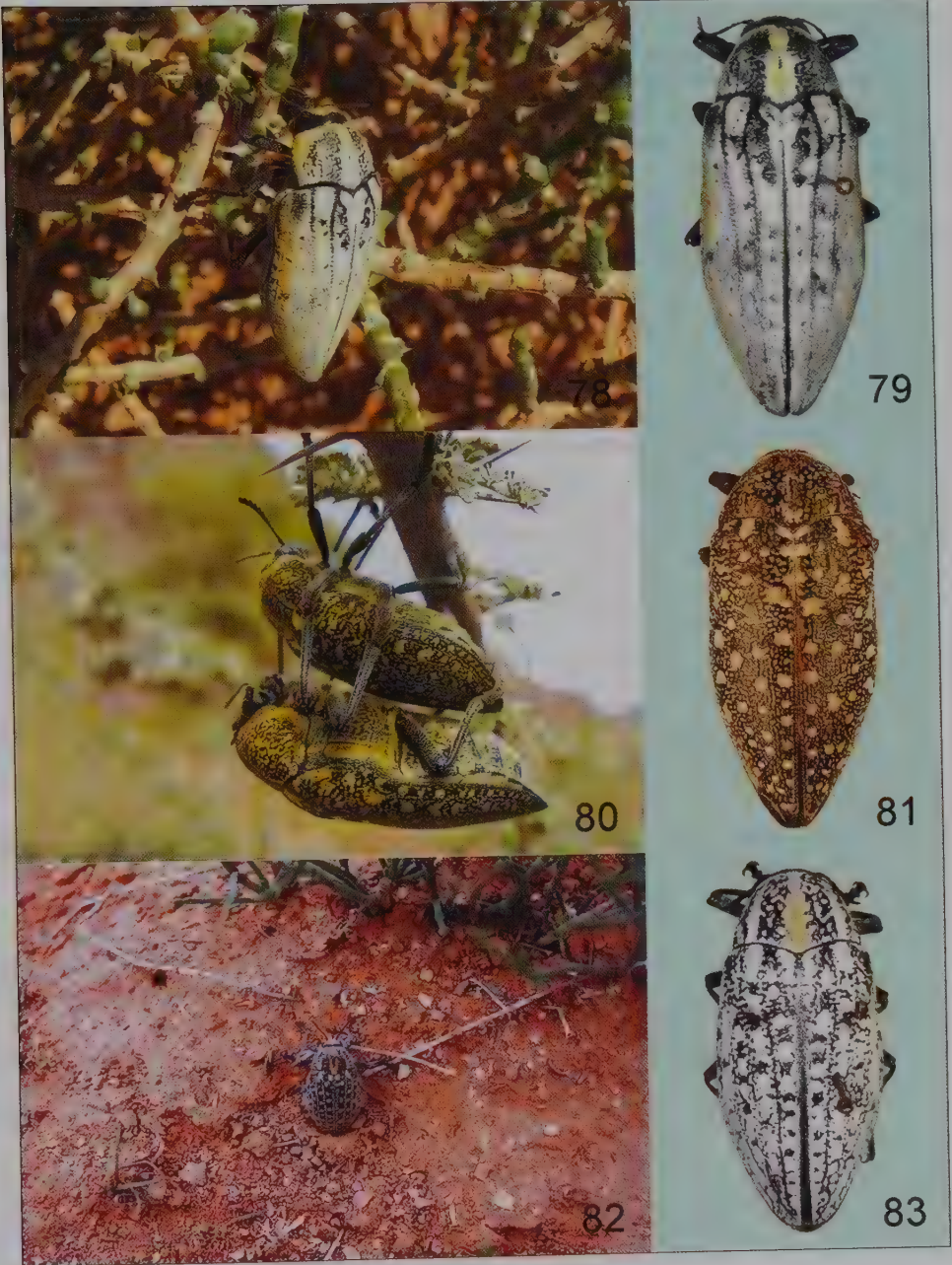
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Plates 78–83. 78: *Julodis candida* Holyński, 1996, specimen feeding on a shrub, UAE, Liwa, Wazeel oasis (Photograph © J. Batelka); 79: *J. candida*, 31.0 mm, the same specimen after mounting; 80: *J. euphratica euphratica* Laporte & Gory, 1835, pre-mating position, UAE, Wadi Shawkah (Photograph © J. Batelka); 81: *J. e. euphratica*, 32.0 mm, “Arabie” (MNHN); 82: *J. syriaca palmyrensis* Obenberger, 1923, female depositing eggs into the soil, Western Jordan, Wadi Mujib, Al Qatrana, Saliya, 15.iv.2002 (Photograph © M. Snížek); 83: *J. speculifer dicksonae* Théry, 1936, female, 29.0 mm, Saudi Arabia, Eastern Province, Udhailiyah Camp (NMPC).

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Authors' addresses:

- S. Bílý, Czech University of Life Sciences, Faculty of Forestry and Wood Sciences, Department of Forest Protection and Game Management, Kamýcká 1176, CZ-165 21 Praha 6 – Suchbát, Czech Republic; e-mail: svatopluk_bily@nm.cz
- V. Kubáň, Department of Entomology, National Museum, Golčova 1, CZ-148 00 Praha 4, Czech Republic; e-mail: vkuban@volny.cz
- M.G. Volkovitsh, Zoological Institute RAS, Universitetskaya nab. 1, R-199034 Saint Petersburg, Russia; e-mail: polycest@zin.ru
- M.Yu. Kalashian, Scientific Center of Zoology and Hydroecology of National Academy of Sciences of Armenia, P. Sevak str., 7, 0014, Yerevan, Armenia; e-mail: mkalashian@yahoo.com

Order Coleoptera, family Nitidulidae

Josef Jelínek and Jiří Hájek

INTRODUCTION

The family Nitidulidae of the superfamily Cucujoidea has a worldwide distribution and contains nearly 4,000 species (Kirejtshuk, 2008; Jelínek et al., 2010). No data on the fauna of the United Arab Emirates has been available previously and the records in the recent catalogue of Palaearctic Coleoptera (Jelínek & Audisio, 2007) are based on the results of the present paper. Only little is known also about the fauna of neighbouring territories, such as Saudi Arabia and Yemen (Jelínek, 1979, 1988) and Iran (Audisio, 1993; Jelínek, 1981).

The bionomy of Nitidulidae is diverse. Many are mycosaprophagans feeding on various fermenting or moulded organic substrates, or mycetophagans, developing in the fruiting bodies of higher fungi. Phytophagous nitidulids develop almost exclusively in flowers of Angiosperms, feeding on pollen and generative structures of flowers. Major part of the known Nitidulidae is associated with tropical and temperate arboreal habitats and only few species are really eremial. Some mycosaprophagous species may feed on ripen or decaying fruits and become either pests of stored products, or pests in the plantations and orchards, damaging crops and transmitting some fungal diseases (Audisio et al., 1990). Many such species became widespread by the global trade and acclimatized in regions remote from their original habitats (Dobson, 1954; Audisio et al., 1990; Jelínek, 2007). These species belonging to the genera *Epuraea* Erichson, 1843, and *Carpophilus* Stephens, 1830, also represent a major part of the currently known fauna of the United Arab Emirates.

MATERIALS AND METHODS

All specimens dealt with in the present paper have been collected by A. van Harten. Genera are ordered systematically, species within a genus/ subgenus in alphabetic order. Synonymy is given only exceptionally, referring to recent changes in nomenclature. Biological and ecological data are either cited from literature, or based on own observations and experience. For more detailed information see Audisio (1993). The photographs of all species were taken with a Canon EOS 550D digital camera with Canon MP-E 65 mm objective. Images of the same specimen at different focal planes were combined using Helicon Focus 5.1.19 software. The specimens recorded in this paper will be partly deposited in the United Arab Emirates Invertebrate Collection and partly in the National Museum, Prague. Abbreviations that refer to the collecting methods: LT – light trap, MT – Malaise trap, WT – water trap; other abbreviations: NARC – National Avian Research Centre, UAE – United Arab Emirates.

SYSTEMATIC ACCOUNT

Subfamily *Epuraeinae* Kirejtshuk, 1986

Epuraea (Haptoncus) luteola Erichson, 1843

Plate 1

Specimens examined: Al-Ajban, 2 ex., 6–22.v.2006, LT; 2 ex., 26.ii–27.iii.2006, LT. Bithnah, 1 ex., 31.xii.2005–2.ii.2006, LT. Fujairah, 3 ex., 5.iii–6.iv.2005, LT; 3 ex., 6.iv–2.v.2005, LT; 2 ex., 28.ii–1.iv.2006, LT; 37 ex., 15–22.iv.2006, LT; 2 ex., 17–24.vii.2005, LT; 1 ex., 15–22.iv.2006, LT; 8 ex., 20–27.v.2006, LT; 3 ex., 20–27.v.2006, LT; 21 ex., 8.xii.2005–2.i.2006, LT; 19 ex., 13–29.xi.2005, LT. Hatta, 1 ex., 22–29.i.2006, LT; 7 ex., 19–28.iii.2006, LT; 1 ex., 4–11.iv.2006, LT; 9 ex., 8–26.iv.2006,

LT; 5 ex., 24–30.v.2006, LT; 1 ex., 17–24.viii.2006, LT; Near Mahafiz, 7 ex., 29.xii.2005–7.i.2006, LT. Sharjah Desert Park, 1 ex., 25.i–22.ii.2005, LT; 2 ex., 21–29.iii.2005, LT; 6 ex., 29.iii–6.iv.2005, LT; 4 ex., 23–30.vi.2005, LT; 12 ex., 6–30.iv.2005, LT; 3 ex., 30.iv–31.v.2005, LT; 7 ex., 30.vi–21.vii.2005, LT; 10 ex., 11.xii.2005–18.i.2006, LT; 2 ex., 25.ii–25.iii.2006, LT; 3 ex., 18.i–25.ii.2006, LT; 21 ex., 29.x–24.xi.2007, LT; 4 ex., 5–12.v.2007, LT; 6 ex., 24.xi–22.xii.2007, LT. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–22.iii.2006, LT; 2 ex., 31.v–7.vi.2006, LT; 1 ex., 7–14.vi.2006, LT. NARC, near Sweihan, 1 ex., 9–20.iv.2005, LT; 1 ex., 29.xii.2005–22.i.2006, LT. Wadi Madaq, 3 ex., 27.iv–4.v.2006, LT; 7 ex., 1–8.vii.2006, LT. Wadi Safad, 27 ex., 20.xii.2005–2.i.2006, LT; 9 ex., 14–21.v.2006, LT; 1 ex., 31.i–21.ii.2006, LT; 1 ex., 31.i–21.ii.2006, MT. Wadi Wurayah, 1 ex., 18–25.iii.2007, MT.

Differential diagnosis: Small (1.8–2.6 mm) brown-yellow species characterized by temples acutely prominent behind eyes and male posterior tibiae abruptly dilated in distal half.

Bionomy and ecology: Mycosaprophagous species occurring on ripen as well as moulded and decaying fruits, also in orchards and plantations. It may play an important role as the pest of cultivated fruits and as vector of some fungal diseases (Audisio, 1993; Audisio & Scaramozzino, 1990; Audisio et al., 1990).

Geographic distribution: Cosmopolitan invasive species of unknown origin. In the Middle East known since the 1970's (Audisio, 1993).

Subfamily **Carpophilinae** Erichson, 1843

Carpophilus (Carpophilus) hemipterus (Linnaeus, 1758)

Plate 2

Specimens examined: Al-Ajban, 4 ex., 10–17.x.2005, MT & LT; 7 ex., 28.xii.2005–29.i.2006, LT; 22 ex., 26.ii–27.iii.2006, LT; 5 ex., 6–22.v.2006, LT; 6 ex., 27.v–26.vi.2006, LT. Bithnah, 2 ex., 31.xii.2005–2.ii.2006, LT; 3 ex., 19.x–16.xi.2006, MT; 3 ex., 16.xi–26.xii.2006, MT. Fujairah, 5 ex., 5.iii–6.iv.2005, LT; 3 ex., 6.iv–2.v.2005, LT; 1 ex., 8.xii.2005–2.i.2006, LT. Hatta, 1 ex., 24–30.v.2006, LT. Khor al-Khwair, 1 ex., 22.ii–1.iii.2007, LT. Near Mahafiz, 13 ex., 29.xii.2005–7.i.2006, LT. Sharjah, 17 ex., 27.iv–5.vi.2005, LT. Sharjah-Khor Kalba, near tunnel, 4 ex., 16–21.i.2006, LT; 6 ex., 7–22.iii.2006, LT; 10 ex., 7–14.vi.2006, LT. Sharjah Desert Park, 4 ex., 25.i–22.ii.2005, LT; 10 ex., 9–21.iii.2005, LT; 4 ex., 21–29.iii.2005, LT; 22 ex., 29.iii–6.iv.2005, LT; 5 ex., 23–30.vi.2005, LT; 16 ex., 6–30.iv.2005, LT; 27 ex., 30.iv–31.v.2005, LT; 13 ex., 31.v–30.vi.2005, LT; 8 ex., 30.vi–21.vii.2005, LT; 1 ex., 21.vii–5.viii.2005, LT; 10 ex., 11.xii.2005–18.i.2006, LT; 8 ex., 25.ii–25.iii.2006, LT; 11 ex., 10–17.iii.2007, LT; 4 ex., 18.i–25.ii.2006, LT; 12 ex., 29.x–24.xi.2007, LT; 9 ex., 5–12.v.2007, LT; 9 ex., 24.xi–22.xii.2007, LT; 3 ex., 20.x–24.xi.2007, LT. NARC, near Sweihan, 4 ex., 1.ii–14.iii.2005, LT; 32 ex., 2–30.iv.2005, LT; 3 ex., 11–21.v.2005, LT; 2 ex., 29.xii.2005–22.i.2006, LT; 9 ex., 26.ii–2.iv.2006, LT; 4 ex., 16.xi–21.xii.2006, LT. Wadi Madaq, 1 ex., 21.xii.2005–2.ii.2006, LT; 1 ex., 19.x–9.xi.2006, MT. Wadi Safad, 1 ex., 20.xii.2005–2.i.2006, LT; 1 ex., 2–26.i.2006, LT; 1 ex., 14–21.v.2006, LT; 1 ex., 27.xi–22.xii.2005, LT; 1 ex., 31.i–21.ii.2006, MT. Wadi Wurayah, 9 ex., 18–25.iii.2007, MT.

Differential diagnosis: Length 2.0–4.0 mm. Elytra abbreviated as in all *Carpophilus* species, leaving two terminal abdominal segments uncovered. Mesosternum divided by a fine mediolongitudinal and sometimes less distinct transverse carinae into four parts. Elytra yellow with nearly z-shaped transverse brown-black band leaving humeral corner and posterior third of each elytron yellow; the dark pigmentation sometimes more extended, leaving only humeral and posterior sutural corners of elytra yellow. Specimens with the latter colour pattern differ from similar Mediterranean *C. quadrisignatus* Erichson, 1873, by the absence of deep impressions on the hypopygium in male and truncate pygidium in female.

Bionomy and ecology: Phytosaprophagous species, originally probably developing on various fermenting fruits, now often pest of cultivated fruits and of stored products.

Geographic distribution: Cosmopolitan species, long time ago dispersed worldwide. Judging from the distribution of its close relatives, it probably originates from the Middle East.

***Carpophilus (Carpophilus) indicus* Hisamatsu, 1963**

Plate 3

Specimens examined: Fujairah, 1 ex., 20–27.v.2006, LT. Hatta, 3 ex., 8–26.iv.2006, LT; 2 ex., 4–11.iv.2006, LT. Sharjah, 1 ex., 27.iv–5.vi.2005, LT; 1 ex., 28.vi–23.vii.2005, LT. Wadi Madaq, 1 ex., 21.xii.2005–2.ii.2006, LT.

Differential diagnosis: Length 1.9–2.8 mm. Related to *C. hemipterus*, from which it differs by more distinctly arcuate sides of pronotum and elytra and generally more reduced (but variable) yellowish pattern on elytra. From a very similar *C. indicus* differs by comparatively longer pronotum, which is 1.42–1.58 times wider than long, and by male genitalia with characteristic membranose lobe on outer lateral margins of parameres.

Bionomy and ecology: Probably not different from *C. hemipterus*. Occurring on fermenting fruits or on the fermenting sap of wounded trees (Audisio, 1993).

Geographic distribution: From India and Sri Lanka to Jordan, Saudi Arabia, Kuwait and UAE (Jelínek & Audisio, 2007).

***Carpophilus (Carpophilus) jelineki* Audisio & Kirejtshuk, 1989**

Plate 4

Carpophilus pictus Jelínek, 1986 (nec Herbst, 1841)

Specimens examined: Al-Ajban, 1 ex., 6–22.v.2006, LT; 1 ex., 27.v–26.vi.2006, LT. Fujairah, 1 ex., 13–29.xi.2005, LT. Khor al-Khwair, 1 ex., 22.ii–1.iii.2007, LT. Sharjah, 1 ex., 27.iv–5.vi.2005, LT. Sharjah Desert Park, 1 ex., 9–21.iii.2005, LT; 1 ex., 11.xii.2005–18.i.2006, LT. NARC, near Sweihan, 1 ex., 26.ii–2.iv.2006, LT. Wadi Madaq, 2–16.ii.2006, LT; 1 ex., 24.iv–4.v.2006, LT.

Differential diagnosis: Length 1.7–3.0 mm. Similar to *C. indicus*, from which it differs especially by the absence of membranose lobes at lateral margins of parameres and more strongly transverse pronotum, 1.55–1.72 times wider than long. Colour pattern of elytra variable (see Jelínek, 1986).

Bionomy and ecology: Apparently the same as in *C. hemipterus* and *C. indicus*.

Geographic distribution: India, southern Iran, Kuwait, Saudi Arabia and UAE.

***Carpophilus (Carpophilus) obsoletus* Erichson, 1843**

Plate 5

Specimens examined: Al-Ajban, 1 ex., 27.v–26.vi.2006, LT. Bithnah, 1 ex., 16.xi–26.xii.2006, MT. Fujairah, 8 ex., 15–22.iv.2006, LT; 3 ex., 17–24.vii.2005, LT; 1 ex., 17–24.vii.2005, LT; 1 ex., 15–22.iv.2006, LT; 3 ex., 20–27.v.2006, LT. Hatta, 1 ex., 24–30.v.2006, LT. Khor al-Khwair, 1 ex., 22.ii–1.iii.2007, LT. Sharjah, 10 ex., 27.iv–5.vi.2005, LT; 3 ex., 28.vi–23.vii.2005, LT. Sharjah Desert Park, 1 ex., 25.i–22.ii.2005, LT; 2 ex., 6–30.iv.2005, LT; 2 ex., 30.vi–21.vii.2005, LT; 1 ex., 18.i–25.ii.2006, LT; 1 ex., 29.x–24.xi.2007, LT. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–22.iii.2006, LT. NARC near Sweihan, 1 ex., 2–30.iv.2005, LT; 1 ex., 16.xi–21.xii.2006, LT. Wadi Madaq, 1 ex., 27.iv–4.v.2006, LT; 2 ex., 1–8.vii.2006, LT; 11 ex., 29.vii–26.v.2006, MT; 2 ex., 26.viii–9.ix.2006, MT.

Differential diagnosis: Length 2.3–3.7 mm. Elytra and mesosternum as in *C. hemipterus*, body completely brown-black, humeral corners of elytra sometimes reddish.

Bionomy and ecology: Occurring on various decaying vegetal substrates.

Geographic distribution: Subcosmopolitan species, probably originating from the Oriental region, currently acclimatized in most tropical and subtropical regions of the world.

***Carpophilus (Myothorax) mutilatus* Erichson, 1843**

Plate 6

Specimens examined: Al-Ajban, 2 ex., 10–17.x.2005, MT & LT; 9 ex., 28.xii.2005–29.i.2006, LT; 3 ex., 26.ii–27.iii.2006, LT; 4 ex., 2–9.iv.2006, MT; 8 ex., 1.iv–2.v.2006, MT; 3 ex., 6–22.v.2006, LT; 9 ex., 27.v–26.vi.2006, LT; 2 ex., 26.vi–2.vii.2006, MT. Bithnah, 2 ex., 31.xii.2005–2.ii.2006, LT. Fujairah, 1 ex., 5.iii–6.iv.2005, LT; 3 ex., 6.iv–2.v.2005, LT; 10 ex., 17–24.vii.2005, LT; 7 ex., 15–22.iv.2006, LT; 6 ex., 17–24.vii.2005, LT; 3 spec., 28.ii–1.ix.2006, LT; 5 ex., 6.iv–2.v.2005, LT; 17 ex., 20–27.v.2006, LT; 5 ex., 8.xii.2005–2.i.2006, LT; 6 ex., 13–29.xi.2005, LT. Hatta, 12 ex., 8–26.iv.2006, LT; 16 ex., 24–30.v.2006, LT; 12 ex., 17–24.viii.2006, LT; 3 ex., 4–11.iv.2006, LT. Near Mahafiz,



Plates 1–4. 1: *Epuraea* (*Haptoncus*) *luteola* Erichson; 2: *Carpophilus* (*Carpophilus*) *hemipterus* (Linnaeus); 3: *Carpophilus* (*Carpophilus*) *indicus* Hisamatsu; 4: *Carpophilus* (*Carpophilus*) *jelineki* Audisio & Kirejtshuk.

5 ex., 29.xii.2005–7.i.2006, LT. Sharjah, 7 ex., 27.iv–5.vi.2005, LT; 5 ex., 28.vi–23.vii.2005, LT. Sharjah Desert Park, 3 ex., 25.i–22.ii.2005, LT; 1 ex., 22.ii–9.iii.2005, LT; 2 ex., 9–21.iii.2005, LT; 1 ex., 21–29.iii.2005, LT; 2 ex., 29.iii–6.iv.2005, LT; 5 ex., 23–30.vi.2005, LT; 20 ex., 6–30.iv.2005, LT; 10 ex., 30.iv–31.v.2005, LT; 2 ex., 31.v–30.vi.2005, LT; 8 ex., 30.vi–21.vii.2005, LT; 3 ex., 21.vii–5.viii.2005, LT; 9 spec., 11.xii.2005–18.i.2006, LT; 1 ex., 25.ii–25.iii.2006, LT; 2 ex., 10–17.iii.2007, LT; 3 ex., 18.i–25.ii.2006, LT; 55 ex., 29.x–24.xi.2007, LT; 10 ex., 5–12.v.2007, LT; 5 ex., 24.xi–22.xii.2007, LT; 1 ex., 20.x–24.xi.2007, LT. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–22.iii.2006, LT. NARC, near Sweihan, 1 ex., 14.iii–2.iv.2005, LT; 18 ex., 2–30.iv.2005, LT. 2 ex., 29.xii.2005–22.i.2006, LT. Wadi Madaq, 46 ex., 1–8.vii.2006, LT; 1 ex., 2–16.ii.2006, LT; 4 ex., 7–14.vi.2006, LT; 10 ex., 29.vii–26.v.2006, MT. Wadi Safad, 3 ex., 20.xii.2005–2.i.2006, LT; 2 ex., 2–26.i.2006, LT; 4 ex., 27.xi–22.xii.2005, LT; 4 ex., 31.i–21.ii.2006, MT; 2 ex., 14–21.v.2006, LT. Wadi Wurayah, 20 ex., 18–25.iii.2007, MT.

Differential diagnosis: Length 2.0–3.7 mm. Mesosternum simple, without fine mediolongitudinal carina. Rusty to yellow-red, metasternum and abdominal sterna and sometimes also the disc of pronotum to various extent infusate. Punctures on the pronotal disc separated by one diameter or less.

Bionomy and ecology: Developing on various decaying vegetal substrates, often on fruits (Audisio, 1993).

Geographic distribution: Cosmopolitan species of uncertain origin.

***Carpophilus (Myothorax) nepos* Murray, 1864**

Plate 7

Carpophilus freemani Dobson, 1956

Specimens examined: Fujairah, 2 ex., 20–27.v.2006, LT; 11 ex., 17–24.vii.2005, LT; 1 ex., 28.ii–1.iv.2006, LT; Hatta, 3 ex., 19–28.iii.2006, LT; 16 ex., 8–26.iv.2006, LT; 13 ex., 24–30.v.2006, LT; 9 ex., 17–24.viii.2006, LT; 1 ex., 19.x–16.xi.2006, MT; Khor al-Khwair, 18 ex., 17–24.iv.2007, LT. Near Mahafiz, 2 ex., 29.xii.2005–7.i.2006, LT. Sharjah, 1 ex., 28.vi–23.vii.2005, LT. Sharjah Desert Park, 1 ex., 21–29.iii.2005, LT; 1 ex., 6–30.iv.2005, LT; 2 ex., 10–17.iii.2007, LT; 8 ex., 29.x–24.xi.2007, LT. Wadi Madaq, 1 ex., 2–16.ii.2006, LT; 2 ex., 1–8.vii.2006, LT. Wadi Safad, 1 ex., 14–21.v.2006, LT. Wadi Wurayah, 1 ex., 18–25.iii.2007, MT.

Differential diagnosis: Length 1.7–2.9 mm. Similar to *C. mutilatus*, but generally smaller and paler, colour pattern variable, pronotum and posterior margin of elytra often infusate. Punctures on pronotal disc sparser, separated by markedly more than one diameter.

Bionomy and ecology: Not different from that of *C. mutilatus*, frequent pest of stored products.

Geographic distribution: Subcosmopolitan species of uncertain origin, currently acclimatized in the tropical and subtropical area throughout the world

***Urophorus (Anophorus) humeralis* (Fabricius, 1798)**

Plate 8

Specimens examined: Al-Ajban, 1 ex., 1.iv–2.v.2006, MT. Bithnah, 3 ex., 31.xii.2005–2.ii.2006, LT. Fujairah, 2 ex., 28.ii–1.ix.2006, LT. Hatta, 1 ex., 22–29.i.2006, LT; 1 ex., 17–24.viii.2006, LT. Sharjah Desert Park, 2 ex., 31.v–30.vi.2005, LT; 1 ex., 11.xii.2005–18.i.2006, LT; 1 ex., 10–17.iii.2007, LT. Wadi Madaq, 1 ex., 2–16.ii.2006, LT; 1 ex., 29.vii–26.v.2006, MT; 1 ex., 19.x–9.xi.2006, MT. Wadi Safad, 1 ex., 2–26.i.2006, LT; 1 ex., 31.i–21.ii.2006, MT.

Differential diagnosis: Length 2.7–5.0 mm. Oval, convex, elytra shortened, leaving three abdominal segments exposed. Black-brown to black, anterior pronotal corners as well as the humeral corners of elytra reddish.

Bionomy and ecology: Mycosaprophagous species occurring on various fermenting vegetal substrates.

Geographic distribution: Cosmopolitan species, originating from the Palaetropics.



Plates 5–8. 5: *Carpophilus* (*Carpophilus*) *obsoletus* Erichson; 6: *Carpophilus* (*Myothorax*) *mutilatus* Erichson; 7: *Carpophilus* (*Myothorax*) *nepos* Murray; 8: *Urophorus* (*Anophorus*) *humeralis* (Fabricius).

Subfamily **Nitidulinae** Latreille, 1802***Nitidula eremita*** Audisio, 1990

Plate 9

Nitidula ciliata Erichson, 1843 (nec Olivier, 1790)

Specimens examined: Al-Ajban, 1 ex., 27.v–26.vi.2006, LT. Near Mahafiz, 4 ex., 29.xii.2005–7.ii.2006, LT. Sharjah, 12 ex., 27.iv–5.vi.2005, LT. Sharjah-Khor Kalba, near tunnel, 1 ex., 16–31.i.2006, LT; 18 ex., 7–14.vi.2006, LT. Sharjah Desert Park, 3 ex., 25.i–22.ii.2005, LT; 3 ex., 9–21.iii.2005, LT; 2 ex., 21–29.iii.2005, LT; 2 ex., 29.iii–6.iv.2005, LT; 3 ex., 6–30.iv.2005, LT; 2 ex., 30.iv–31.v.2005, LT; 1 ex., 11.xii.2005–18.i.2006, LT; 1 ex., 10–17.iii.2007, LT; 12 ex., 29.x–24.xi.2007, LT. NARC, near Sweihan, 13 ex., 1.ii–14.iii.2005, LT; 10 ex., 14.iii–2.iv.2005, LT; 17 ex., 16.xi–21.xii.2006, LT; 4 ex., 26.ii–2.iv.2006, LT; 18 ex., 16.xi–21.xii.2005, LT; 1 ex., 29.xii.2005–22.i.2006, LT. Wadi Madaq, 27.xi–22.xii.2005, LT.

Differential diagnosis: Length 4.0–7.0 mm. Among other species of *Nitidula* Fabricius, 1775, can be easily recognized by its larger size and pale yellow colouration variable and rather indistinct small blackish spots.

Ecology and biology: All species of the Holarctic genus *Nitidula* are scavengers developing primarily on carrions, and secondarily also on other moulded substrates. *Nitidula eremita* is one of true eremial species of Nitidulidae, as suggested also by its pale colouration. Adults occur mostly in winter and spring, as observed already by Audisio (1993).

Distribution: North Africa, Israel, Iraq, southern Iran and Saudi Arabia. (Audisio, 1993; Jelínek & Audisio, 2007).

Subfamily **Meligethinae** C.G. Thomson, 1859***Meligethinus gedrosiacus*** Jelínek, 1981

Plate 10

Specimens examined: Al-Ajban, 10 ex., 27.v–26.vi.2006, LT; 2 ex., 26.vi–2.vii.2006, MT. Bithnah, 9 ex., 31.xii.2005–2.ii.2006, LT. Fujairah, 13 ex., 5.iii–6.iv.2005, LT; 1 ex., 6.iv–2.v.2005, LT; 2 ex., 15–22.iv.2006, LT. Hatta, 7 ex., 22–29.i.2006, LT; 5 ex., 4–11.iv.2006, LT; 3 ex., 8–26.iv.2006, LT. Near Mahafiz, 32 ex., 29.xii.2005–7.ii.2006, LT. Sharjah, 1 ex., 27.iv–5.vi.2005, LT. Sharjah Desert Park, 10 ex., 25.i–22.ii.2005, LT; 4 ex., 22.ii–9.iii.2005, LT; 4 ex., 9–21.iii.2005, LT; 6 ex., 21–29.iii.2005, LT; 27 ex., 29.iii–6.iv.2005, LT; 1 ex., 6–30.iv.2005, LT; 9 ex., 11.xii.2005–18.i.2006, LT; 6 ex., 18.i–25.ii.2006, LT; 3 ex., 25.ii–25.iii.2006, LT; 5 ex., 10–17.iii.2007, LT. Sharjah-Khor Kalba, near tunnel, 3 ex., 7–22.iii.2006, LT. NARC, near Sweihan, 3 ex., 2–30.iv.2005, LT; 7 ex., 29.xii.2005–22.i.2006, LT. Wadi Madaq, 14 ex., 21.xii.2005–2.ii.2006, LT; 55 ex., 2–16.ii.2006, LT. Wadi Safad, 1 ex., 2–26.i.2006, LT; 7 ex., 31.i–21.ii.2006, LT. Wadi Wurayah, 5 ex., 12–14.iv.2005, MT & WT; 8 ex., 10–26.xii.2006, WT.

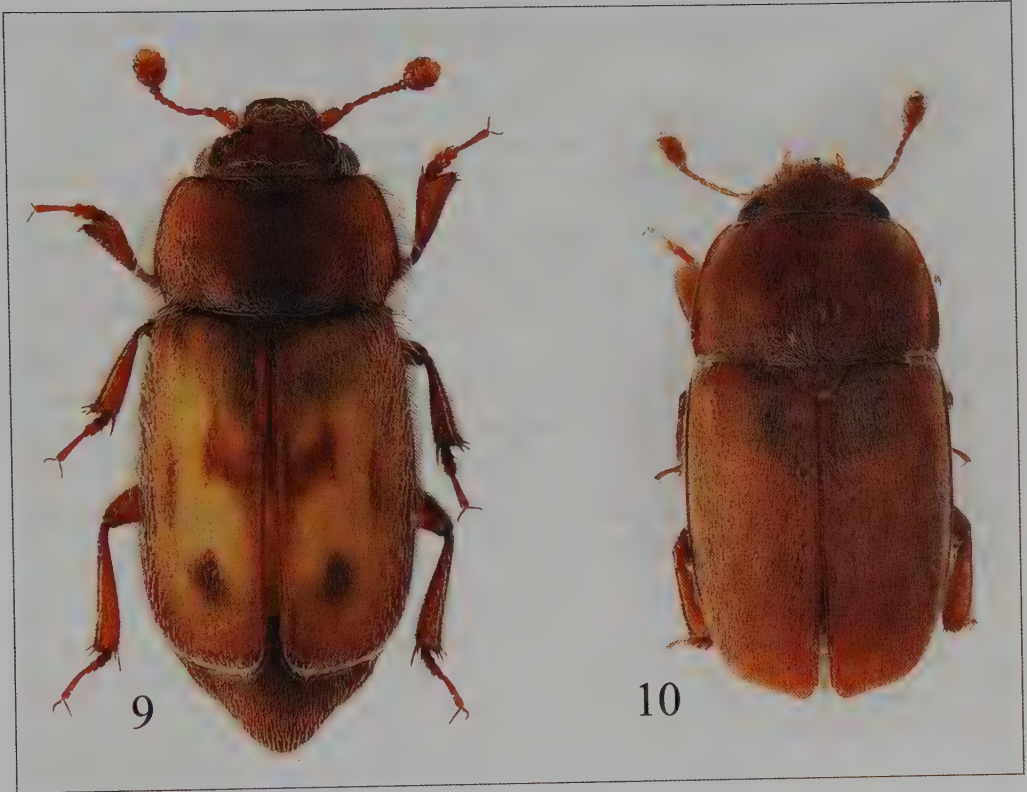
Differential diagnosis: Length 2.0–2.5 mm. Oblong oval, yellow–brown. From the Mediterranean *Meligethinus pallidulus* (Erichson, 1843) differs by larger size and distinctly explanate sides of pronotum. Tips of elytra acuminate in female.

Ecology and bionomy: Like other species of the genus, *M. gedrosiacus* probably lives in the inflorescences of palms. Hitherto known only in a few specimens. More extensive material from the UAE listed above suggests that adults occur from December to April.

Distribution: UAE, Saudi Arabia, southern Iran.

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Plates 9–10. 9: *Nitidula eremita* Audisio; 10: *Meligethinus gedrosiicus* Jelinek.

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Authors' addresses:

J. Jelínek, Department of Entomology, National Museum, Kunratice 1, CZ-148 00 Praha 4, Czech Republic; e-mail: JJ.Nitidula@seznam.cz

J. Hájek, Department of Entomology, National Museum, Kunratice 1, CZ-148 00 Praha 4, Czech Republic; e-mail: jiri_hajek@nm.cz

Order Coleoptera, family Silvanidae

David G. H. Halstead

INTRODUCTION

The family Silvanidae is a comparatively small one, currently with 56 described genera containing about 470 species. Thomas (1984) reassessed relationships within the family and recognized two subfamilies, Uleiotaenae (with two tribes and now called Brontinae) and Silvaninae. All of the species recorded here belong to the latter subfamily and like most of these beetles are relatively small.

The subfamily Silvaninae is represented throughout the world. Common genera belonging to this subfamily include: *Silvanus* Latreille, 1804 (Old World plus three species indigenous to the New), *Airaphilus* Redtenbacher, 1858, *Monanus* Sharp, 1879, *Oryzaephilus* Ganglbauer, 1899 and *Silvanoprus* Reitter, 1911 (all apparently of Old World origin), and *Ahasverus* Gozis, 1881, *Cathartus* Reiche, 1854 and *Nausibius* Lentz, 1857 (indigenous to the New World). A few species are pests of stored food products such as cereals, dried fruits, nuts, oilseeds and their derivatives, and have been widely distributed by man. The two most important of these are the well-known *Oryzaephilus* species, *O. surinamensis* (Linnaeus) (the Saw-toothed Grain Beetle) and *O. mercator* (Fauvel) (the Merchant Grain Beetle), beetles that, at least in man made habitats, have almost cosmopolitan distributions.

Natural habitats for silvanine species are the subcorticolous habitat, under loose bark of fallen or felled trees where fungal spores and hyphae form part of their diet, fallen fruits and seeds, leaf litter, humus and sometimes leaf sheaths or axils. A few specialized genera occur as inquilines. The under bark habitat has probably also been responsible for the spread of Silvaninae as they are sometimes found alive on imported timber and could have become established where climate and habitats are suitable.

As far as I am aware, apart from a paper on the silvanids and laemophloeids of Saudi Arabia by Slipinski (1984), little is known regarding the silvanid fauna of the Arabian Peninsula. Slipinski recorded only *O. surinamensis* (Linnaeus, 1758), *O. mercator* (Fauvel, 1889) and an *Airaphilus* species of uncertain identity.

A new species of *Synoemis* Pascoe, 1863 from the United Arab Emirates is described and illustrated here, *Synoemis thomasi* nov. spec. It is compared with the Oriental *Synoemis pandani* Pascoe, 1863, the only previously described member of the genus, and notes on the genus *Synoemis* are included. Records, including brief notes on distribution, identification etc., and illustrations for 8 other silvanines, which do not seem to have been recorded from the UAE before, are also presented. The new species is possibly an introduction to the UAE, while several of the other eight have almost certainly been introduced by commerce.

MATERIALS AND METHODS

The photographs were kindly taken by Dr. Michael C. Thomas. Those for habitus illustrations were made using a Syncroscopy Auto Montage ® system through a Leica Z16 APO microscope; that for the genitalia of the new species with a Zeiss Photo-Microscope III adapted to use a Nikon Coolpix 8400 digital camera.

Genitalia were dissected as described in Halstead (1980) and have been mounted on the card/card point holding the specimen, in a drop of dimethyl hydantoin formaldehyde resin.

All specimens of UAE silvanids recorded below were collected in traps, mostly in light traps, but some in water traps and Malaise traps, by Antonius van Harten. Voucher specimens of the species are deposited in the UAEIC, additional material of some of them in the NHM, FSCA and the author's collection.

Abbreviations used for collections:

NHM	Natural History Museum, London, England
FSCA	Florida State Collection of Arthropods, Gainesville, Florida, USA
MNHN	Muséum National d'Histoire Naturelle, Paris, France
UAEIC	United Arab Emirates Invertebrate Collection, UAE

Other abbreviations used: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap; WT = water traps.

SYSTEMATIC ACCOUNT

Airaphilus syriacus Grouvelle, 1874

Plate 1

Specimen examined: Wadi Madaq, 1 ex., 6–13.v.2006, LT.

Distribution and notes on identification, etc.: This species has been recorded only from the type locality, 'Syria' (Grouvelle, 1874). Identification of species of *Airaphilus* can be very difficult because there are no comprehensive up-to-date revisions or keys to the genus. Grouvelle (1878) redescribed *A. syriacus* and later included it in a key to the genus in his notes on 'Silvanini' (Grouvelle, 1913). However, my identification is mainly based on a comparison with types (2 specimens) that are in the MNHN (Grouvelle collection). The habitats recorded for members of this genus include haystacks, dune grass and damp meadows. The head of the specimen illustrated (see Plate 1) is bent down; the full length of the head to breadth ratio (breadth measured between the eyes) is 15:10.

Monanus concinnulus (Walker, 1858)

Plate 2

Specimens examined: Fujairah, 1 ex., 6.iv–2.v.2005, LT. Sharjah Desert Park, 1 ex., 6–30.iv.2005; 3 ex., 8–15.vii.2007; all LT.

Distribution and notes on identification, etc.: This species is widely distributed in the Old and New World tropics and is often very common where it occurs. The genus *Monanus* seems to be particularly associated with leaf litter (including haystacks) and leaf sheaths. *M. concinnulus* has occasionally been found in small numbers associated with various food commodities but it is of no importance as a pest. Commerce has probably played a major role in its wide distribution. This is a readily recognized species and is dealt with in detail by Halstead (1993).

Oryzaephilus canus Halstead, 1980

Plates 3–4

Specimens examined: Al-Ajban, 13 ex., 10–17.x.2005, LT & MT; 5 ex., 17.x–9.xi.2005, LT; 1 ex., 9.xi–7.xii.2005, LT & MT. Sharjah Desert Park, 1 ex., 31.v–30.vi.2005; 3 ex., 21.vii–5.viii.2005; all LT.

Distribution and notes on identification etc.: *O. canus* seems to be essentially an East African species and was described from Sudan, Somalia, Kenya and Tanzania (Halstead, 1980). During more recent years it has been seen by the author from Saudi Arabia: Gizan by the Red Sea; Yemen: Wadi Zabid and Suqutra (Socotra) Island (new records) and now from the UAE. *O. canus* is similar to *O. mercator* but may be distinguished from this species by the head, which has less prominent eyes and is frequently relatively smaller when compared with the pronotum, the usually grey appearance of the setae, the lack of a metafemoral tooth in the



Plates 1–2. 1: *Airaphilus syriacus* Grouvelle (Length 3.18 mm, front part of head hidden, see text); 2: *Monanus concinnulus* (Walker) (Length 2.22 mm).

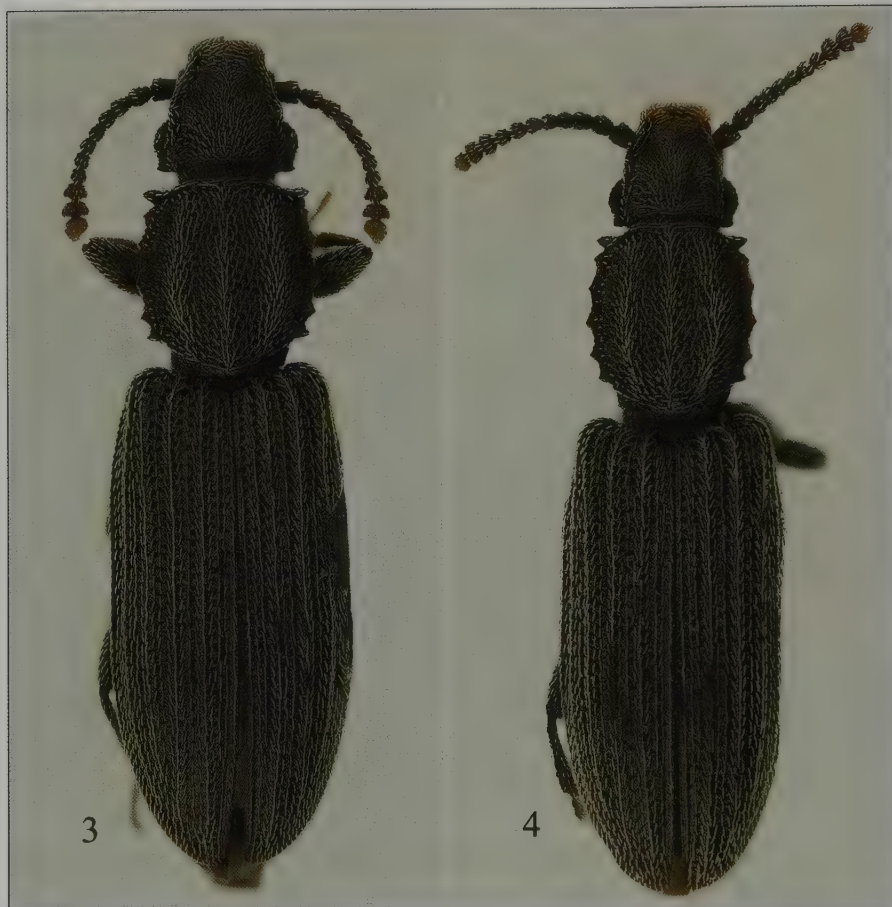
male (present in *O. mercator*), and the male genitalia (see original description). As in other *Oryzaephilus* spp., the pronotum of the male is usually obviously longer than that of the female (compare Plates 4, 6 & 8 with 3, 5 & 7).

***Oryzaephilus mercator* (Fauvel, 1889)**

Specimens examined: Al-Ajban, 1 ex., 17.x–9.xi.2005; 2 ex., 9.xi–7.xii.2005; all LT & MT. Bithnah, 1 ex., 4–26.iii. 2006, LT. Fujairah, 2 ex., 6.iv–2.v.2005, LT. Sharjah, 1 ex., 24.ix–9.x.2005, LT. Sharjah Desert Park, 3 ex., 31.v–30.vi.2005; 3 ex., 21.vii–5.viii.2005; all LT. Wadi Madaq, 1 ex., 29.xi–22.xii.2005, LT; 1 ex., 2–16.ii.2006, LT; 1 ex., 27.iv–4.v.2006, WT. Wadi Safad, 1 ex., 20.xii.2005–2.i.2006, LT.

Distribution and notes on identification: This is a well-known, almost cosmopolitan pest carried to all parts of the world in association with stored food products. In cooler, more temperate regions it has become established only in artificially heated premises. The shorter temples, larger eyes and the male genitalia distinguish this species from *O. surinamensis* (see Halstead, 1980 and 1993).

Plates 5–6



Plates 3–4. *Oryzaephilus canus* Halstead. 3: Female (length 3.1 mm), 4: Male (length 2.71 mm).

***Oryzaephilus surinamensis* (Linnaeus, 1758)**

Plates 7–8

Specimens examined: Bithnah, 8 ex., 31.xii.2005–2.ii.2006 [including 2 large ♂ of the form *bicornis* Erichson, 1846], LT; 1 ex., 4–26.iii.2006, LT. Hatta, 1 ex., 19–28.iii.2006, LT. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–22.iii.2006, LT. Wadi Safad, 1 ex., 20.xii.2005–2.i.2006, LT.

Distribution and notes on identification etc.: Like the previous species, *O. surinamensis* is cosmopolitan in association with stored food products and is a common pest species. There are three described strains: small (mean length 2.2 mm) found in the Far East, normal (mean length 2.7 mm) and horned (form *bicornis*), in which large males, usually not less than 2.6 mm long, have a small, backwardly curving horn on each side of the head near the clypeus. The horned form is particularly common in the Mediterranean Region. The longer temples, smaller eyes, and the male genitalia make this species readily recognizable (see references given above).

***Silvanus castaneus* MacLeay, 1873**

Plate 9

Specimen examined: NARC, near Sweihan, 1 ex., 28.xii.2005–22.i.2006, LT.



Plates 5–6. *Oryzaephilus mercator* (Fauvel). 5: Female (length 3.5 mm), 6: Male (length 3.05 mm).

Distribution and notes on identification etc.: *S. castaneus* was described from Australia and has been recorded from the Oriental and Australasian Regions including Singapore, Indonesia, Papua New Guinea, Australia and Tasmania. It has occasionally been found on imports to Britain and is well established in the wild in Florida. Like other *Silvanus* species, it occurs under bark. The form of the anterior angles of the pronotum with margins almost straight-sided, the small temples combined with eyes of average size, and the puncturation of the head (clypeus and frontal region differentiated from that of the rest of the dorsal side) distinguishes this species from closely similar ones (see Halstead, 1973 and 1993).

***Silvanus difficilis* Halstead, 1973**

Specimen examined: Al-Ajban, 1 ex., 17.x–9.xi.2005, LT.

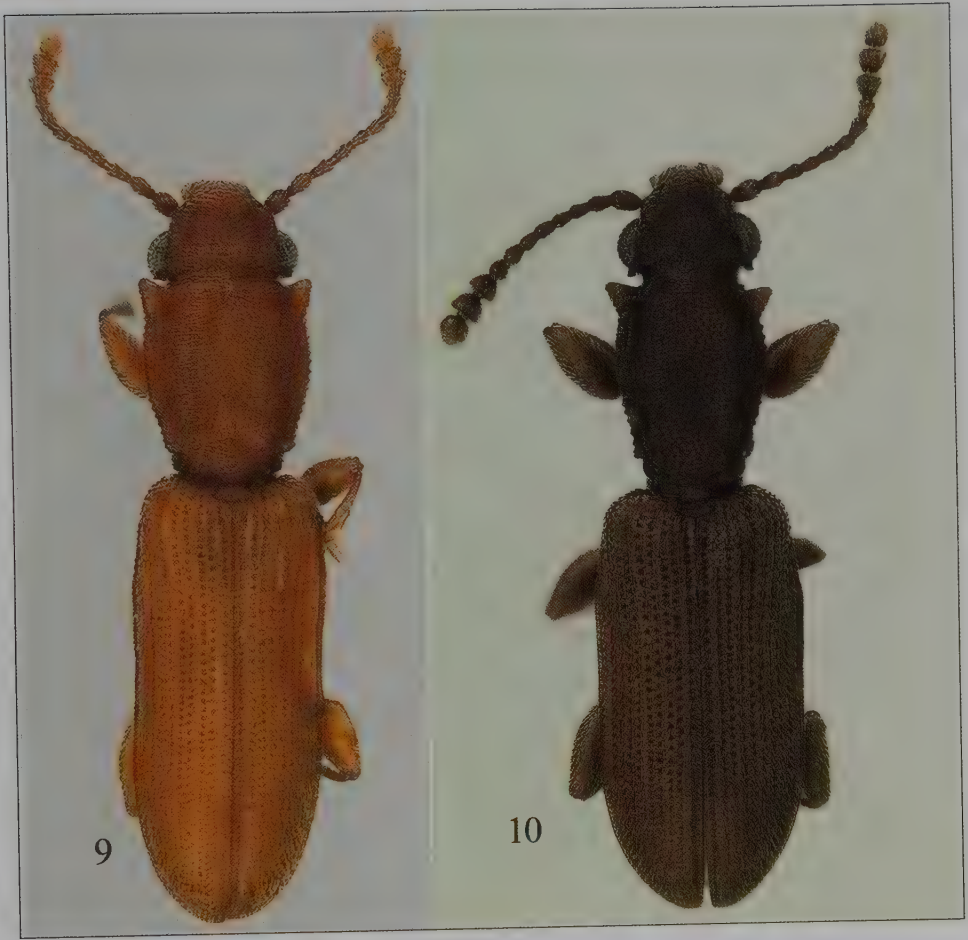
Distribution and notes on identification, etc.: *S. difficilis* is a very variable species that, in addition to having a pronotum which varies in breadth and anterior angles that vary in taper, it has temples that vary considerably in length. The typical form, common and widely

Plate 10



Plates 7–8. *Oryzaephilus surinamensis* (Linnaeus). 7: Female (length 3.0 mm), 8: Male, *bicornis*-form (length 3.4 mm).

distributed in the Oriental Region, has short temples whereas the specimen from al-Ajban has long temples. This form with long temples is common in Papua New Guinea, where the typical form also occurs. In addition, the form with long temples occurs in New Ireland and Australia (N. Queensland). The typical form has been found in Costa Rica and Brazil, where it may be established, and occasionally on commodities imported to Britain. The natural habitat is under bark. (See above for references.)



Plates 9–10. 9: *Silvanus castaneus* (MacLeay) (length 3.01 mm); 10: *Silvanus difficilis* Halstead (Length 2.8 mm) (length 6.2 mm).

***Silvanus lewisi* Reitter, 1876**

Specimen examined: Wadi Maidaq, 1 ex., 2–16.ii.2006, LT.

Distribution and notes on identification etc.: *S. lewisi* is widespread in the Oriental and Australasian Regions, and also occurs in the Palaearctic (Japan and China) and Afrotropical Regions. In the past it has often been imported to Britain in small numbers on stored food products and dunnage from the Oriental Region and sometimes from Africa. This species, which like other *Silvanus* spp. is subcorticolous, has been found on wooden doors imported from Brazil to Britain (Halstead, 1993), perhaps suggesting that it may occur there. Single specimens were found in buildings in South Florida (Thomas and Peck, 1991) and also in Florida during 2009 when a large well-established population was discovered by light trapping in a port lumber house (Michael Thomas, personal communication). However, it is not known if the species has become established outside in Florida. *S. lewisi* may be distinguished from other similar species by its very large eyes combined with very small temples (shorter than an eye facet), pronotum with sides not strongly convergent to base

(unlike *S. difficilis*) and anterior angles not very large (see Halstead, 1973 & 1993). Anterior angles in this species are slightly variable and those of the specimen from Wadi Madaq are a little more broadly based than is commonly the case.

Genus *Synoemis* Pascoe, 1863

Plates 12–18, Figures 1–7

Notes on the genus: *Synoemis* was erected by Pascoe (1863) for a new silvanine from Malaysia, which he called *Synoemis pandani* Pascoe. The type material, which is in the NHM, was collected in Pinang (then known as Penang), where it was found in considerable abundance in the axils of the leaves of *Pandanus*. This species also occurs in the Philippines, Palawan Is., Culion Is., and Calapan (new records), where it has been collected from the same habitat as the types. No other species has been described since *S. pandani*. However, a few years ago I discovered an undescribed species from Sarawak, represented by a small specimen (length 3.75 mm), lacking an abdomen and one leg, amongst the undetermined accessions in the NHM. This species, which I intend to describe elsewhere, is quite distinct. It has prominent eyes that are particularly large (over twice the length of the temples, latter measured from back of head to eye), apices of the anterior pronotal angles rounded and antennae with a quite obvious 3-segmented club. An additional new species, *Synoemis thomasi* nov. spec., is described below. Although apparently well established in the UAE, as it has been collected over the period 2005–2008, it may represent an introduction perhaps on ornamental plants.

Pascoe's description of this very elongate, depressed and rather characteristic genus does not include two interesting and useful characters that are exhibited by the three species known to me. These characters, which alone could be used to distinguish the genus from other elongate and depressed silvanines, including genera such as *Protosilvanus* Grouvelle, 1913 (Oriental) and *Parasilvanus* Grouvelle, 1913 (Afrotropical), are as follows:

- a) pronotum with a row of minute, short, longitudinal ridges by the anterior margin,
- b) head with the anterior margin emarginate and bearing small, anteriorly directed processes of variable development (blunt to pointed) on each side of the emargination (see Figs 1 & 5 for illustrations).

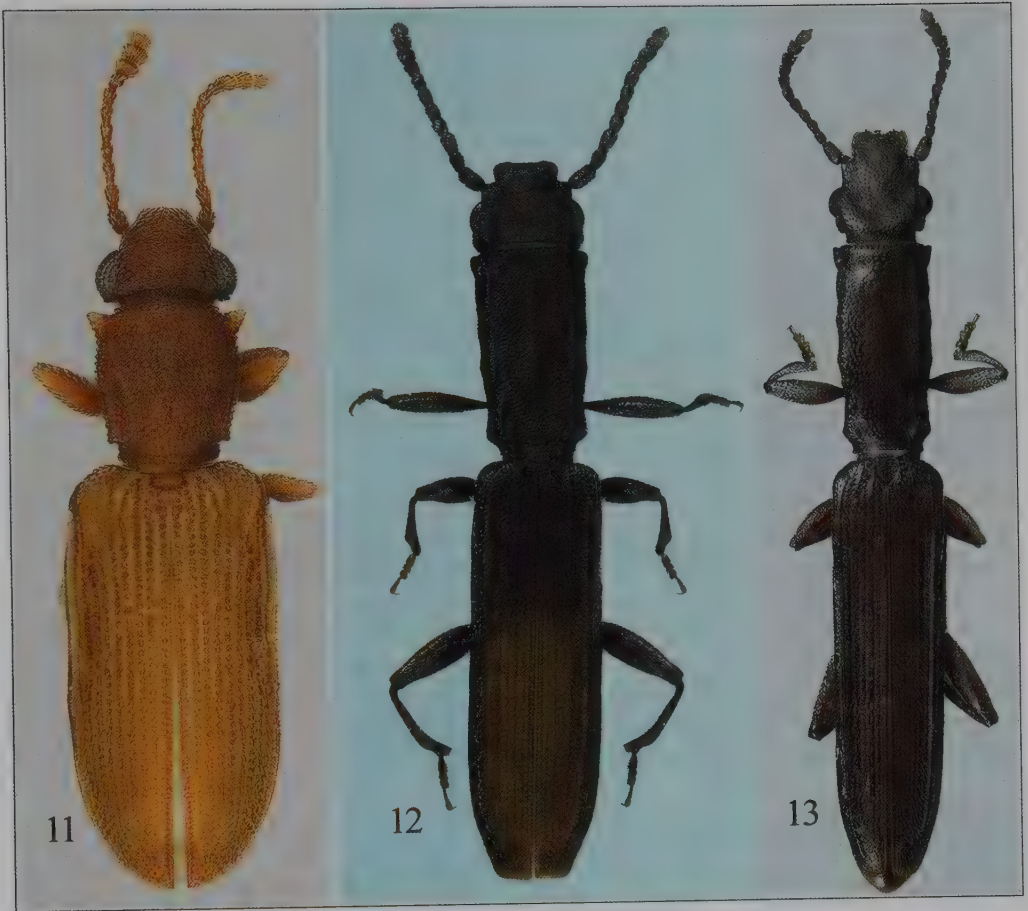
Pascoe recorded the presence of a curved, impressed line at the base of the pronotum. This rather inconspicuous line, which is shallowly curved and situated just before the posterior margin, is present in all three species and is noteworthy (see Figs 1 & 5). A further character with some diagnostic value, included by Grouvelle (1913) and seen in both *S. thomasi* nov. spec., and *S. pandani* (abdomen lost in the third species), is provided by the exposure, to a variable extent, of the pygidium (Fig. 2).

Synoemis thomasi Halstead nov. spec.

Plates 12, 14, 16–18 and Figures 1–4

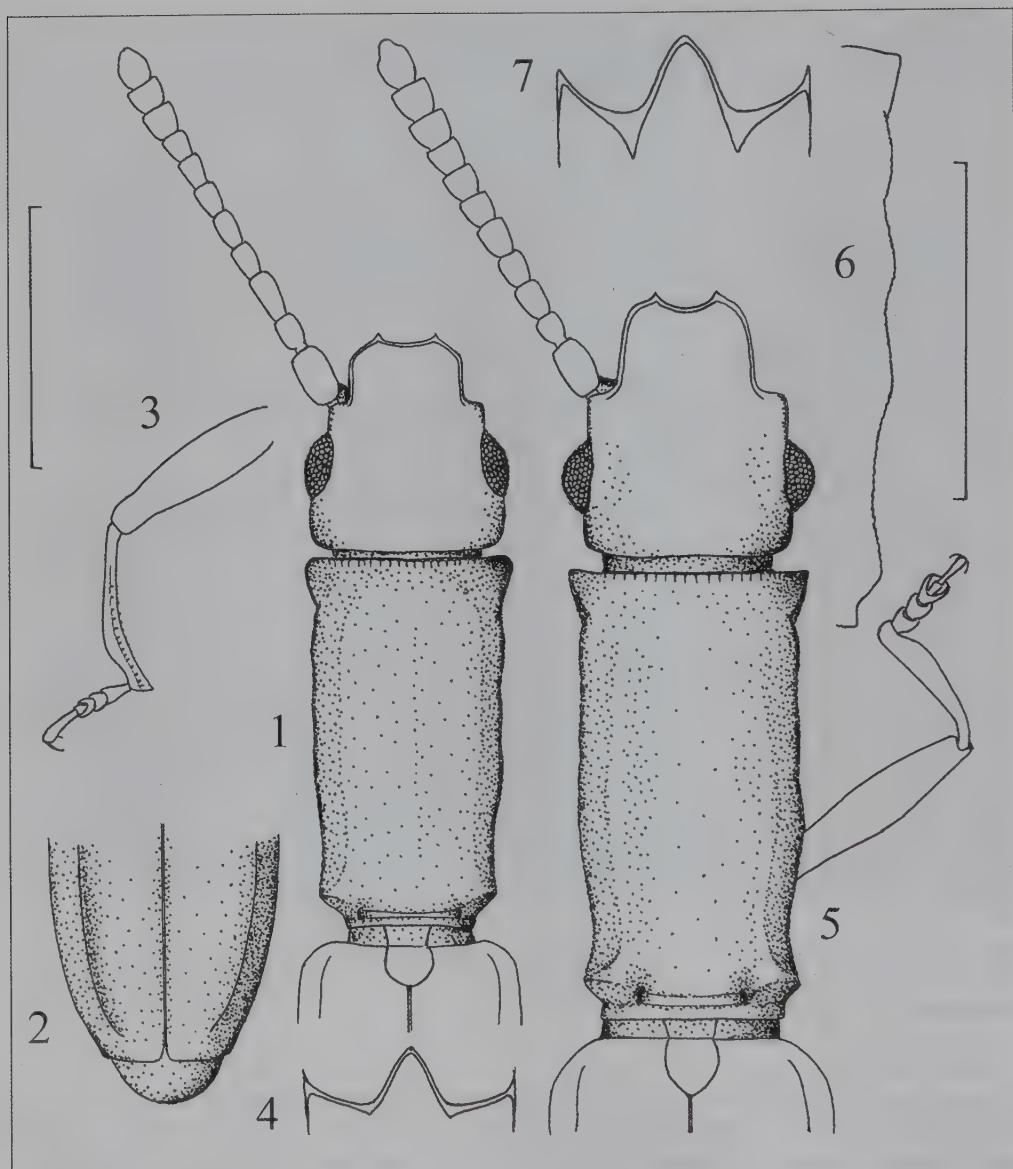
Specimens examined: Holotype: ♂, locality label as follows: "UNITED ARAB EMIRATES Al-Ajban 24.36N 55.01E 09.11–07.12.2005 UAE 3275 light-traps & Malaise traps coll. A. van Harten" (length 5.23 mm) deposited in the FSCA. Paratypes, all with UNITED ARAB EMIRATES, light traps, a reference number and coll. A. van Harten, information omitted here, rest of data as given: 1♂ with same data as holotype; 1♀ & 1♂, near Mahafiz, 7–14.9.2006; 1♂, Wadi Bih dam, 24–29.6.2008; 1♂, Wadi Safad, 26.4–4.5.2006; 2♂, Wadi Safad, 17–24.6.2006; 1♂, Wadi Madaq, 27.4–4.5.2006; 1♂, Fujairah, 13–29.11.2005; 2♀, Sharjah Desert Park, 30.4–31.5.2005. The paratypes have been deposited in the FSCA, NHM and UAEIC.

The following description is based on the above type series of 9♂ and 3♀.



Plates 11–13. 11: *Silvanus lewisi* Reitter (Length 2.61 mm); 12: *Synoemis thomasi* Halstead nov. spec., male, dorsal habitus, abdomen missing (Length 4.78 mm); 13: *Synoemis pandani* Pascoe (from Pinang, Malaysia).

Description: Body. Moderately dark brown, depressed and elongate. Length (including pygidium) female 4.43–4.64 mm, male 4.19–5.23 mm; length : maximum elytral breadth ratio, female 52.6–56.9:10, male 56.2–60.5:10. Conspicuous microreticulation on dorsal side of head and pronotum giving somewhat dull appearance, slightly more shining on elytra. Head. As long or slightly longer than broad (breadth measured across temples), surface flat. Clypeus with fine marginal line, front emarginate, small anteriorly directed process (blunt to pointed) on each side of emargination; sides abruptly angled above concealed antennal insertions; surface conspicuously microreticulate, punctures mostly separated by 2–4 diameters and bearing inconspicuous, short, fine, recumbent setae. Frons, at front and middle with similar surface sculpturing and pubescence, rest of dorsal side of head somewhat rugose with punctures of indeterminate shape. Eyes comparatively flat, separated medially across head by 8–11 maximum breadth, and from front of head by about 1.5 length. Temples



Figures 1–7. *Synoemis* spp. 1–4 *Synoemis thomasi* Halstead nov. spec., male. 1: Head, pronotum and base of elytra; 2: Apical region of elytra showing exposed pygidium; 3: Hind leg; 4: Femoral lines at base of 1st abdominal sternite. 5–7 *Synoemis pandani* Pascoe. 5: Head, pronotum, base of elytra and fore leg of female; 6: Variant of lateral margin of pronotum of large male from Pinang; 7: Femoral lines of another specimen. Scale lines =1 mm, left for *S. thomasi*, right for *S. pandani*.

long, rounded to base of head. Antennae slightly longer than pronotum, scape broader than other antennomeres, pedicel smaller and less elongate than antennomere III which is longer than any other remaining antennomere, VIII slightly less transverse than IX, IX–XI forming

poorly differentiated, 3-segmented club with XI slightly longer than broad. Ventral side (from behind eyes to mouthparts) almost flat, surface somewhat granular, pubescence short, inconspicuous. Labial and maxillary palps similar to those of *Silvanus* spp.

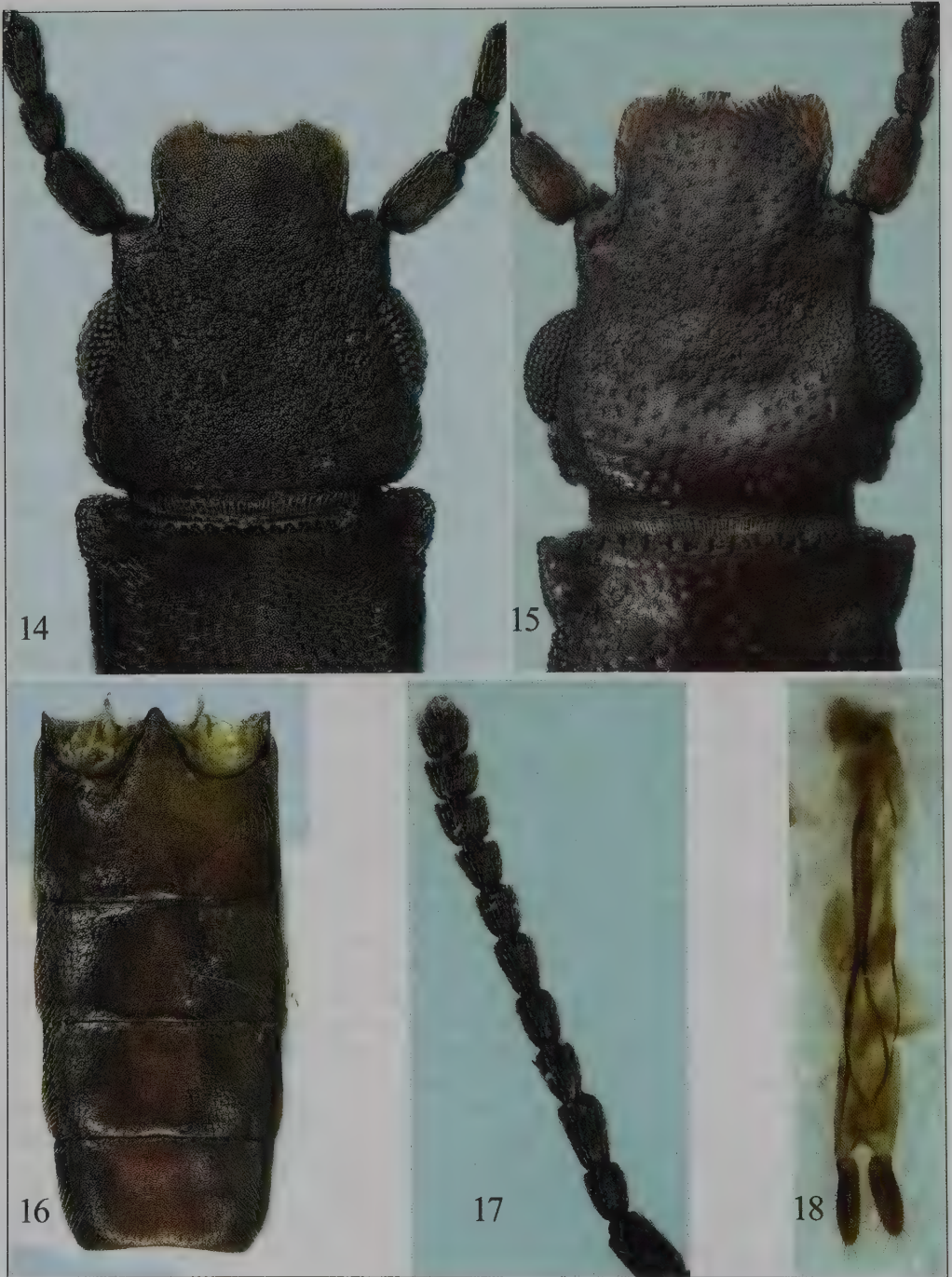
Pronotum. Elongate, male more so than female, length to greatest breadth excluding anterior angles, male (n=9) 17.4–19.7 (m. 18.4):10; female (n=3) 15.5–15.7 (m. 15.7):10, flat, sides declivous. Well defined microreticulation throughout; mid-line impunctate for middle 2/3 or more, rest of disc with punctures larger and denser than on head, separated by 1–2 diameters; pubescence similar to that on head; puncturation on declivity tuberculate. Anterior margin very slightly incurved to middle, a row of minute, longitudinal, short ridges present by margin; anterior angles produced laterally their apices rounded (not pointed), declivous; sides to posterior c. 2/5 without or with slight lateral undulations (perhaps indicative of 3 obsolete lateral prominences) then shallowly inwardly curved to posterior angles; inconspicuous, slightly curved, impressed line joining two lateral impressions present before basal rim; disc unevenly, shallowly depressed on each side of raised median line. Prosternum with apical 1/5 transversely wrinkled, apex of prosternal process about twice as broad as apex of mesosternum; surface similar to that of pronotum but more shining.

Elytra. Elongate, length to maximum breadth ratio, 30–33:10 (male 31.3–33:10, female 30–32.4:10), disc of each shallowly concave; apices truncate exposing pygidium to a variable degree; surface with rows of punctures forming striae, a short, decumbent seta associated with each stria puncture, row of similar setae on each interstria, setae on disc of each elytron predominantly directed posteriorly and slightly angled towards outer margin, also a few longer more widely spaced erect setae (presumably sensory) present on disc but difficult to see, most obvious towards apex; microreticulation is present although less conspicuous than on head and pronotum; 7th interstriae strongly carinate from near humeral angle to near apex, elytra declivous lateral to carinae. Scutellum large, only slightly broader than long (more rounded than usual for silvanines).

Legs. Long, hind longer than others; male metatibiae with row of very small teeth along posterior proximal margin (dorsal proximal margin in mounted specimens) (Plate 12 and Fig. 3), female metatibiae without teeth; tarsi with tarsomere IV very small, IV plus V longer than previous two.

Abdomen. First sternite with femoral lines very slightly produced caudally (Fig. 4). Male genitalia (Plate 18) and associated abdominal sternites (not illustrated): parameres with sides almost parallel on middle 1/3 then weakly tapered to rounded apex, setae present along inner margin and from basal 1/3 on outer margin, apical setae longest; median lobe inconspicuous, apex straight, thickened and bearing several setae (see broad transverse line on Plate 18); internal sac with an armature similar to that of *Oryzaephilus surinamensis* (not illustrated); abdominal sternites 8 and 9 longer than broad, setae present towards and along curved apical margin, 8th with a few setae on each side, not divided.

Differential diagnosis: Comparison of *S. thomasi* nov. spec., with *S. pandani* Pascoe, 1866 (compare Plates 12 & 14 with Plates 13 & 15 and Figs 1–4 with Figs 5–7): This new species is readily distinguished from *S. pandani* by the flatter eyes, which in the latter species are very prominent, the rounded instead of pointed apices of the anterior angles of the pronotum and, on the ventral side, the femoral line which is very slightly produced caudally on the 1st abdominal sternite, whereas in *S. pandani* it is strongly produced forming an acute angle. The antennae of these species also differ in the shape of the scape, pedicel, antennomere III and XI (see Figures). In addition, the legs exhibit differences: tarsomeres, I–III are narrower in *S. thomasi* than in *S. pandani*, V comparatively longer than in *S. pandani*; and teeth on the



Plates 14–18. 14: *Synoemis thomasi* Halstead nov. spec., male, head and part of pronotum; 15: *Synoemis pandani* Pascoe, male, head and part of pronotum; 16–18: *Synoemis thomasi* Halstead nov. spec., male. 16: Abdomen; 17: Antenna; 18: Genitalia (Length 1 mm).

male metatibiae are less prominent than in *S. pandani*. Genitalia of this new species and *S. pandani* are very similar but the parameres of *S. thomasi* are less tapered than those of *S. pandani*, which are gradually tapered from base to apex. In general, based on the material available, although there is considerable overlap in size, the new species seems to be the smaller one.

Etymology: The species is named after Dr. Michael C. Thomas (FSCA) who has greatly extended our knowledge of the taxonomy and systematics of the Laemophloeidae and Silvanidae.

ACKNOWLEDGEMENTS

I wish to thank Dr. Michael C. Thomas for forwarding these very interesting silvanids to me and for making the excellent photographic illustrations for the plates; Dr. Th. Deuve, MNHN, Paris, for the loan of the *A. syriacus* types; Maxwell V. L. Barclay, Dr. Roger G. Booth and other members of the Coleoptera Section at the NHM, London, for assistance during my visits to study material in the collections and for the loan of specimens; and Antonius van Harten for permission to study this material and for his help.

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Author's address:

Dr. D.G.H. Halstead, 57 Meadow Way, Old Windsor, Berks, SL4 2NY, UK.

Order Coleoptera, family Latridiidae

Description of a new species of *Corticaria* Marsham, 1802

Wolfgang H. Rucker

INTRODUCTION

In the first contribution on the family Latridiidae in the United Arab Emirates, 8 species were recorded, of which 3 species are of the genus *Corticaria* Marsham, 1802 (Rucker, 2008). Here a new species of that genus is added, *Corticaria arenosa* nov. spec. Detailed morphological description of the new species and figures of its habitus and male genitalia are provided.

MATERIALS AND METHODS

All specimens were collected in light traps by A. van Harten. The holotype and part of the paratypes will be kept in the Rucker Collection, in future to be deposited in the Museum für Naturkunde, Stuttgart, Germany; the other paratypes will stay in the UAE Invertebrate Collection.

SYSTEMATIC ACCOUNT

Subfamily **Corticariinae** Curtis, 1829

Genus *Corticaria* Marsham, 1802

Corticaria arenosa Rucker nov. spec.

Figures 1–9

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Safad, 25°13'N 56°19'E, 20.xii.2005–2.i.2006, light trap, leg. A. van Harten. Paratypes: 83 ex., same data as holotype. 5 ex., Wadi Safad, 2–26.i.2006; 9 ex., 21.ii–4.iii.2006; 5 ex., 15–22.iv.2006. 1 ex., Fujairah, 13–29.xi.2005; 1 ex., 8.xii.2005–2.i.2006. 6 ex., Sharjah-Khor Kalba, near tunnel, 7–22.iii.2006, light trap; 3 ex., 7–14.vi.2006, light trap. Diagnosis: A large species of *Corticaria* with conspicuously wide body shape. Body length 1.85–2.00 mm, body flat and only moderately arched. Pronotum wide and transverse, with lateral sides evenly rounded and with strong teeth. The whole beetle (Figs 1–2), including legs and antennae, of a yellowish-brown colouration, with uniformly long, oblique, yellow hairs. No visual sexual dimorphism.

Description (holotype): Head. Width 0.43 mm, length 0.16 mm; ratio width:length = 1:0.37. Eyes coarsely faceted, arched, black; diameter of eyes 0.13 mm. Temples barely discernible, corresponding to only $\frac{3}{4}$ of a row of facets; with widely-spaced fine punctation and with fine microsculpture between the punctures. Antenna as in Figures 3 and 6. Length 0.54 mm, with eleven antennomeres and a three-segmented club (Fig. 2); antennomeres I and II thick, longer than broad, antennomeres III and IV $1.5\times$ longer than broad, antennomeres V and VI about $1.25\times$ longer than broad, antennomeres VII and VIII as long as broad, antennomeres IX and X broader than long, antennomere XI as broad as long.

Pronotum. Width 0.614 mm, length 0.487 mm; ratio width/length 1: 0.79; lateral margin with 9–10 very strong teeth, resembling a saw; laterally somewhat flattened; the disc to some extent arched, in front of its base with an very faintly pronounced depression, no foveola;

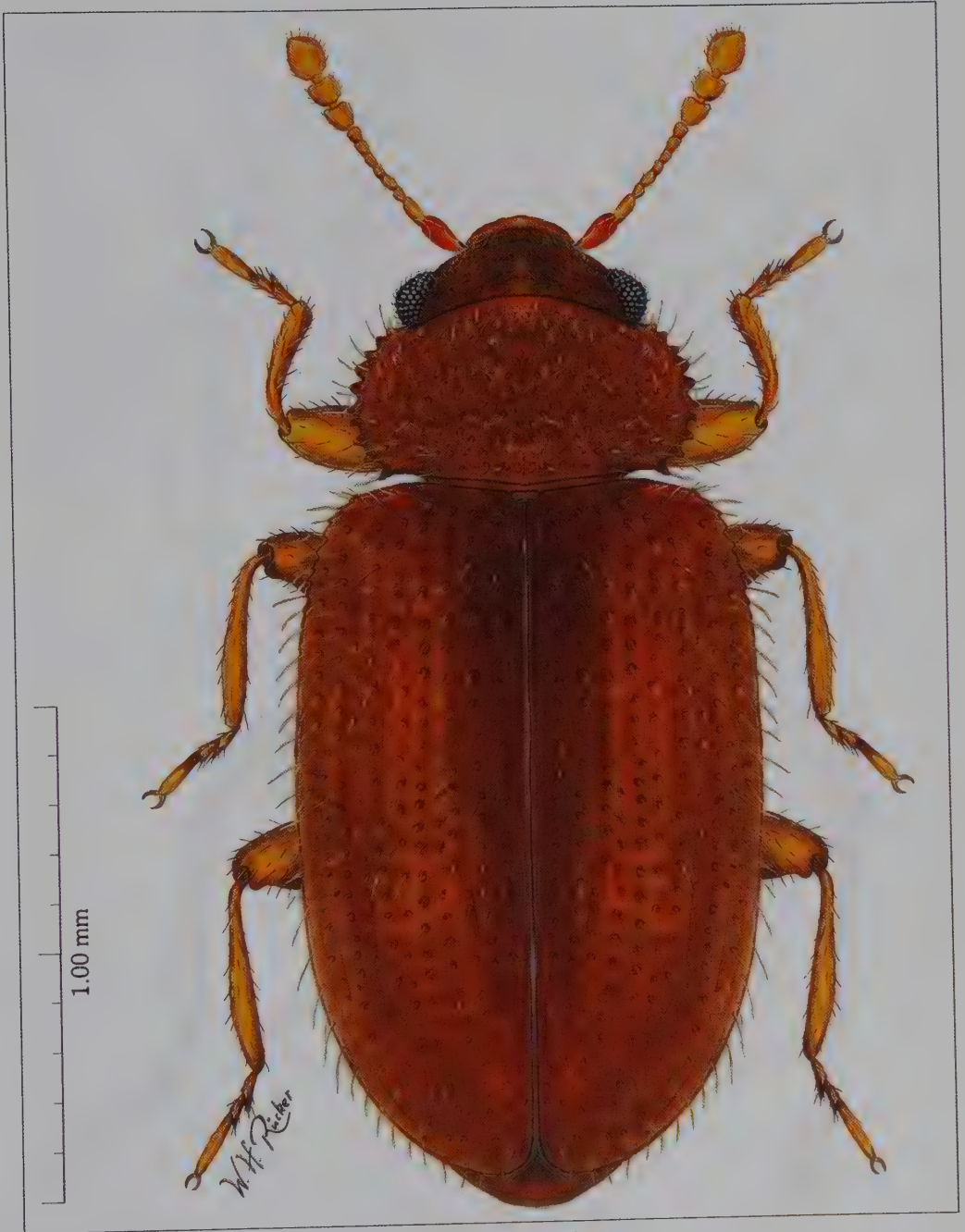
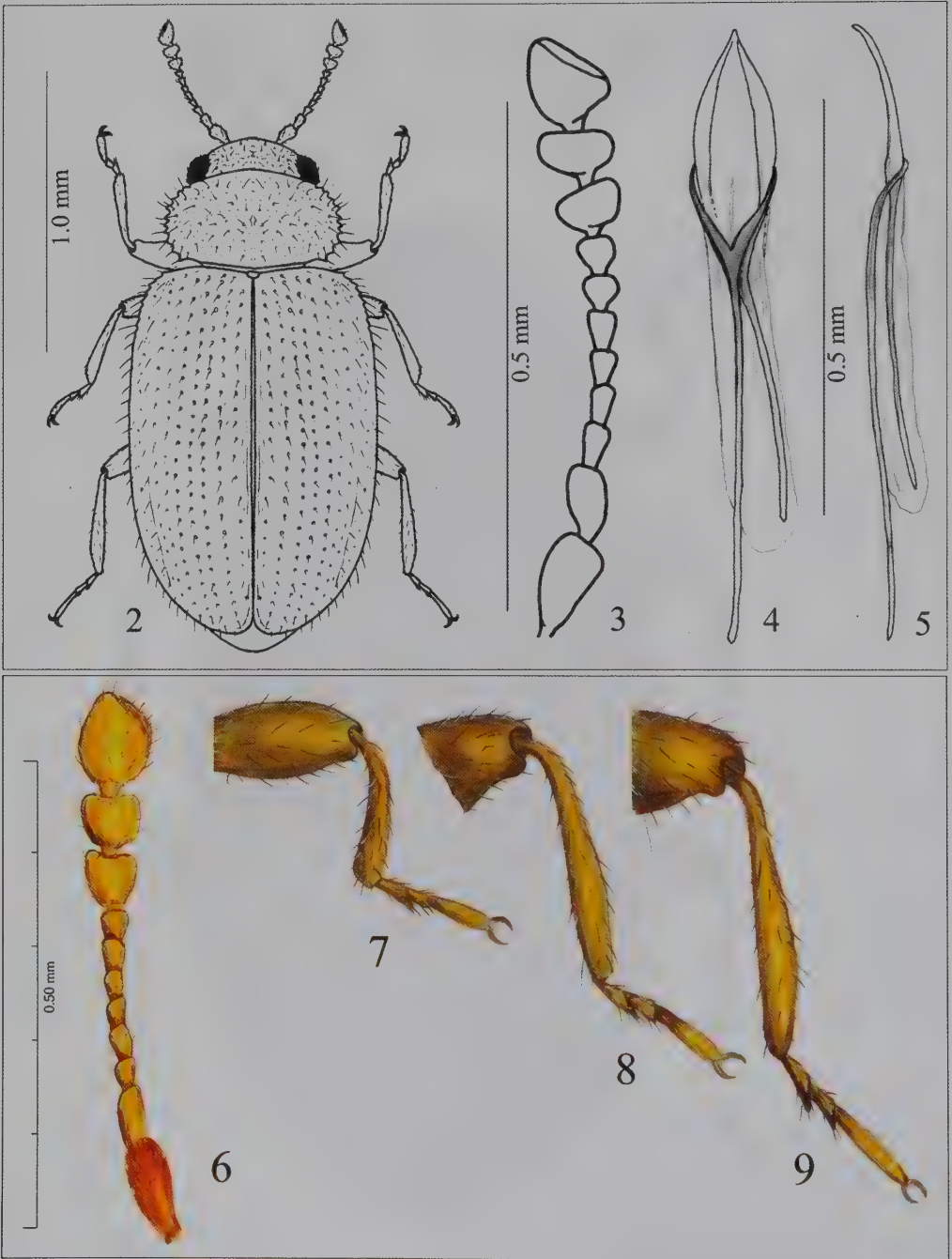


Figure 1. *Corticaria arenosa* nov. spec., paratype, habitus.



Figures 2–9. *Corticaria arenosa* nov. spec. 2: Habitus; 3, 6: Antenna; 4: Aedeagus ventral; 5: Aedeagus lateral; 7: Fore leg; 8: Middle leg; 9: Hind leg.

pubescence long, somewhat oblique, 0.072 mm in length; each tooth with a hair of same length; punctures small and widely-spaced, between the punctures with fine micro-sculpture. Elytra. Width 0.73 mm, length 1.24 mm; ratio width/length 1:1.67, margins parallel-sided; shoulders only weakly pronounced; lateral margins at shoulders with small teeth; each elytron with 8 rows of fine, shallow punctures; number of punctures in each row 28–30; intermediate spaces flat, somewhat shiny, sometimes with isolated small points; pubescence somewhat oblique, long (0.070–0.075 mm), of golden-yellowish colour; distal corners rounded at suture. Legs. Simple, same in male and in female, without teeth or visible spines (Figs 7–9).

Ventral view. Abdomen with short pubescence, without visible punctation.

Aedeagus. Flat in lateral view (Fig. 5), in ventral view symmetrically widening, apex fine and pointed (Fig. 4), total length 0.714 mm; clasps narrow and fine, length about 0.500 mm.

Differential diagnosis: *Corticaria arenosa* nov. spec. can be differentiated from all other species of *Corticaria* by the conspicuous wide shape of the elytra, and, especially, by the wide pronotum. In most *Corticaria* species the pronotum is more or less heart-shaped, with a foveola at its base; the elytra are slender and more arched.

Derivatio nominis: The name of the new species comes from Latin, *arenosa* = rich in sand, indicating that the species lives in an environment with plenty of sand.

ACKNOWLEDGEMENTS

I thank Antonius van Harten for the translation of this chapter, for the production of photographs of the new species used for the preparation of the colour drawing and for the examination of the manuscript.

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Author's address:

W.H. Rucker, Von-Ebner-Eschenbach-Strasse 12, D-56567 Neuwied, Germany; e-mail: coleoptera@latridiidae.de

Order Coleoptera, family Chrysomelidae

Additions and description of a new species

Jan Bezděk and Jan Batelka

INTRODUCTION

In the first contribution to the Chrysomelidae fauna of the UAE in this series, 34 identified and one unidentified species were reported by Lopatin (2008). Additional material of Chrysomelidae, originated partially from the collecting trips of the second author (November 2006, March 2007 and September 2007) and partially from new material collected by A. van Harten and his collaborators, is corroborated here. We report here altogether 39 species of which one is described as a new to science, one is new to the Arabian Peninsula, eight are new to the UAE, one species recorded previously from the UAE by Lopatin (2008) is re-identified and 5 remain unidentified. Based on the study of type material, *Macrocoma hormuziaca* Warchałowski, 2001, is proposed here as a junior synonym of *M. zarudnii* Lopatin, 1985. Illustrations of all species are provided.

MATERIALS AND METHODS

The specimens collected during expeditions of the second author were sampled mostly by individual collecting methods using sweep-net or by occasional light collecting in open habitats. The material corroborated is deposited in the collections of the authors, voucher specimens will be preserved in the UAE Invertebrate Collection and in the National Museum Prague (Czech Republic).

The photographs were taken by Canon EOS 550D with Macro Photo Lens MP-E65mm and mounted with Helicon Focus 5.1.

Exact label data are cited for the type material. A forward slash (/) separates different lines and a double slash (//) separates different labels of data. Additional remarks are in square brackets: [p] – preceding data are printed, [h] – preceding data are handwritten, and [w] – white label.

The nomenclature used follows that of Löbl & Smetana (2010).

Abbreviations used in the text: AvH = leg. A. van Harten; FM & AS = leg. F. Menzel & A. Stark; HP = leg. H. Pinda; JB = leg. J. Batelka; KM = leg. K. Mahmood; LT = light trap; WT = water traps.

SYSTEMATIC ACCOUNT

Subfamily **Cassidinae** Gyllenhal, 1813

Tribe **Hispini** Gyllenhal, 1813

Rhoptrispis dilaticornis (Duvivier, 1891)

Plate 1

Specimens examined: Sharjah Desert Park, 5 ex., 25.iv.2010, KM.

Distribution: Afghanistan, Bangladesh, Bhutan, China (Shandong, Yunnan), Eritrea, Ethiopia, India, Laos, Nepal, Sri Lanka, Taiwan, Thailand, UAE, Vietnam. Reported from the UAE by Lopatin (2008) under its junior synonym *Dactylispis perpusilla* Gestro, 1911.

Subfamily **Cassidinae**Tribe **Cassidini** Gyllenhal, 1813*Hypocassida cornea* (Marseul, 1868)

Plate 2

Specimen examined: Wadi Wurayah farm, 1 ex., 19.i–19.ii.2009, AvH, Malaise trap (will be deposited in the collection of Lech Borowiec, Wrocław, Poland).

Distribution: Widely distributed in southern Europe, North Africa, Syria and Turkey. New to the UAE.

Subfamily **Chrysomelinae** Latreille, 1802*Chrysolina (Bittotaenia) grata brancuccii* (Daccordi, 1982)

Plate 3

Specimen examined: Jebel Jibir, 1380 m., 25°39'00"N 56°07'20"E, 1 ex., 27.iii.2007, JB.

Distribution: Oman. New to the UAE.

Subfamily **Galerucinae** Latreille, 1802*Calomicrus arabicus* Lopatin & Nesterova, 2006

Plate 4

Specimens examined: Near Mahafiz, 1 ex., 21–28.vi.2006, LT, AvH. Wadi Hayl, 225 m, 25°04'N 56°13'E, 1 ex., 5.x.2007, at light, JB & HP. Wadi Safad, 6 ex., 31.i–21.ii.2006, LT, AvH; 2 ex., 21.ii–4.iii.2006, LT, AvH; 1 ex., 22.iv–21.vi.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH.

Distribution: Described and recorded so far only from the UAE (Lopatin & Nesterova, 2006; Lopatin, 2008).

Nymphius emir (Lopatin, 2006)

Plate 5

Calomicrus (Nymphius) emir Lopatin, 2006: 261.

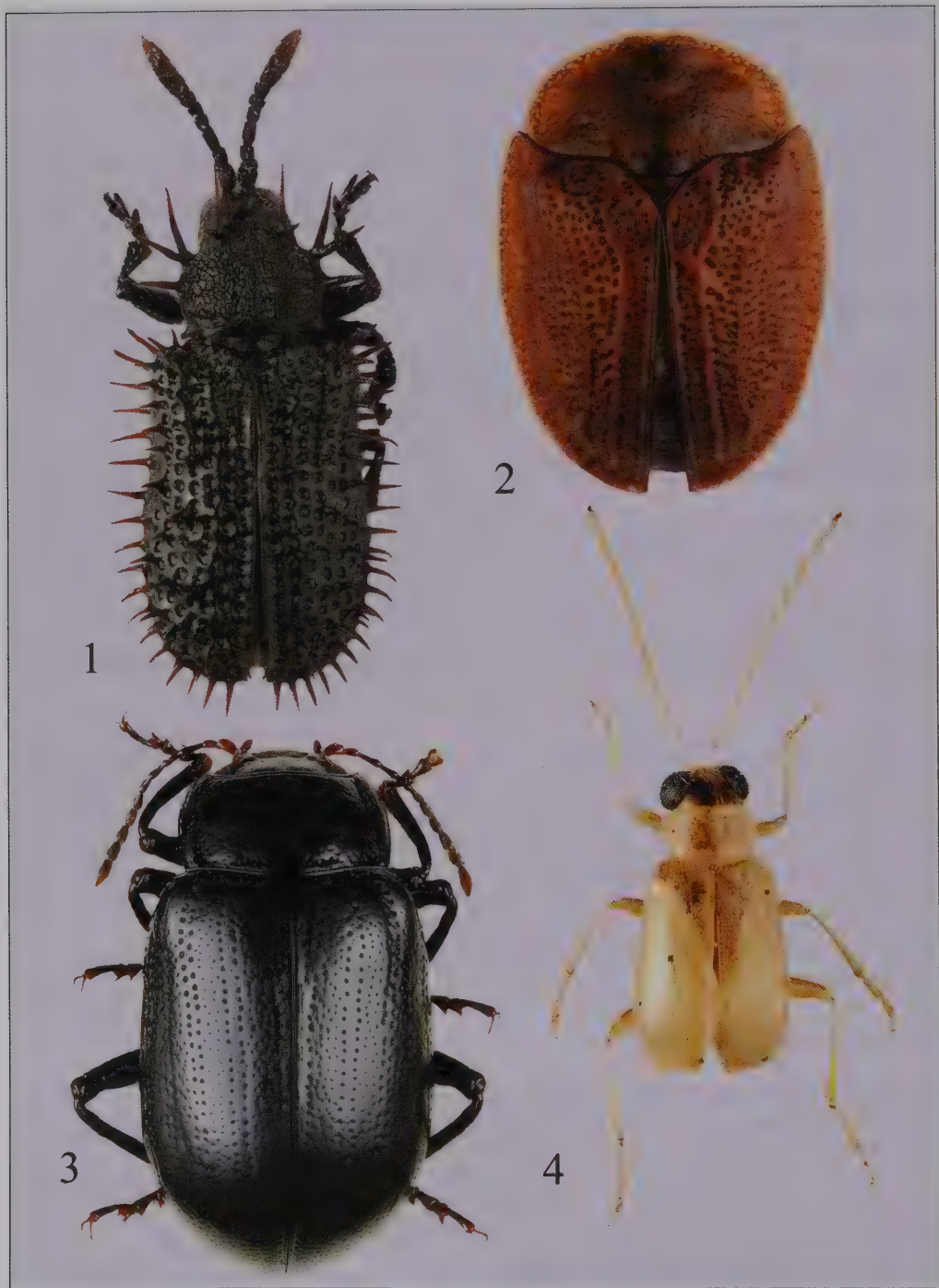
Specimens examined: Khor al-Khwair, 12 ex., 8.iii–7.v.2007, LT, AvH. Wadi Safad, 24 ex., 15–22.iv.2006, LT, AvH; 2 ex., 21.ii–4.iii.2006, LT, AvH; 1 ex., 22.iv–21.vi.2006, LT, AvH. Wadi Shawkah, 250–280 m, 1 ex., 20.iii.2007, JB; 26 ex., 3.x.2007, at light, JB & HP. Wadi Wurayah, 210 m, 1 ex., 25.iii.2007, JB. Wadi Wurayah farm, 7 ex., 1.iv–14.vi.2009, LT, AvH. Wadi Bih dam, 2 ex., 22.ii–1.iii.2007, LT, AvH; 8 ex., 19.ii–30.iv.2008, LT, AvH; 1 ex., 13.xii.2009–8.iii.2010, WT, AvH; 1 ex., 25.iii.2010, KM.

Distribution: Described and recorded so far only from the UAE as *Calomicrus emir* (Lopatin 2006, 2008).

Subfamily **Alticinae** Newman, 1835*Aphthona signatifrons* (Wollaston, 1867)

Plate 6

Specimens examined: N of Ajman, 2 ex., 1.ii–16.iii.2009, WT, AvH. Dibba, 25°32'N 56°14'E, 1 ex., 21.iii.2007, FM & AS. Hatta, 1 ex., 30.i–26.ii.2006, LT, AvH; 12 ex., 17–24.v.2006, LT, AvH. Near Mahafiz, 5 ex., 21–28.vi.2006, LT, AvH. Khor al-Khwair, 1 ex., 8.iii–7.v.2007, LT, AvH. Sharjah, garden, 17 ex., 1–14.xi.2010, WT, AvH. Sharjah, Wasit Protected Area, 1 ex., 7–21.ix.2010, WT, AvH. Sharjah Desert Park, 1 ex., 25.v–15.vii.2008, LT, AvH; 4 ex., 1–30.xi.2008, pitfall traps, AvH. Sharjah-Khor Kalba, near tunnel, 12 ex., 7–14.vi.2006, LT, AvH. Wadi Bih dam, 4 ex., 19.ii–30.iv.2008, LT, AvH; 3 ex., 16.xii.2009–8.iii.2010, WT, AvH; 3 ex., 25.iii.2010, KM. Wadi Hayl, 5 ex., 28.iii.2007, FM & AS. Wadi Madaq, 1 ex., 27.iv–12.vi.2006, LT, AvH; 1 ex., 17.iv.2010, hand-collected, KM. Wadi Safad, 1 ex., 31.i–21.ii.2006, LT, AvH. Wadi Shawkah, 5 ex., 26.iii.2007, JB; 12 ex., 26.iii.2007, FM & AS; 9 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 2 ex., 19.i–19.ii.2009, Malaise trap, AvH; 2 ex., 1.iv–14.vi.2009, LT, AvH.



Plates 1–4. 1: *Rhoptrispia dilaticornis* (Duvivier); 2: *Hypocassida cornea* (Marseul); 3: *Chrysolina grata brancuccii* (Daccordi, 1982); 4: *Calomicrus arabicus* Lopatin & Nesterova.

Distribution: Cape Verde Islands, Congo, Oman, Saudi Arabia, Sudan, Tanzania, Yemen.
Recorded from the UAE by Lopatin (2008).

Aphthona spec.

Plate 7

Specimen examined: Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH.

Chaetocnema hortensis (Geoffroy, 1785)

Plate 8

Specimens examined: Hatta, 1 ex., 17–24.v.2006, LT, AvH. Near Mahafiz, 1 ex., 2.ii–26.iv.2006, LT, AvH. Sharjah Desert Park, 1 ex., 2.iii–1.iv.2007, LT, AvH; 1 ex., 21–28.v.2007, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH. Wadi Madaq, 4 ex., 12.v–15.vii.2006, LT, AvH. Wadi Shawkah, 1 ex., 31.x–27.xi.2006, WT, AvH; 1 ex., 9.iv–24.vi.2007, WT, AvH.

Distribution: Transpalaeartic species, known also from Chad and Sudan. Reported from the UAE by Lopatin (2008).

Chaetocnema ljuba Bechyné, 1955

Plate 9

Specimens examined: Fujairah, 1 ex. 8.iv–10.vi.2006, LT, AvH. Sharjah Desert Park, 1 ex., 2.iii–1.iv.2007, LT, AvH; 1 ex., 21–28.v.2007, LT, AvH; 2 ex., 25.v–15.vii.2008, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH; 2 ex., 24.iii.2010, KM. Wadi Bih dam, 1 ex., 19.ii–30.iv.2008, LT, AvH; 7 ex., 16.xii.2009–8.iii.2010, WT, AvH. Wadi Safad, 1 ex., 15–22.iv.2006, LT, AvH. Wadi Shawkah, 1 ex., 31.x–27.xi.2006, WT, AvH; 2 ex., 9.iv–24.vi.2007, WT, AvH.

Distribution: African species, also reported from the UAE (Lopatin, 2008) and Yemen.

Chaetocnema wollastoni Baly, 1877

Plate 10

Specimens examined: Sharjah, garden, 9 ex., 1–14.xi.2010, WT, AvH. Sharjah Desert Park, 4 ex., 1–30.xi.2008, pitfall traps, AvH.

Distribution: African species, reported also from Cyprus, Israel, Saudi Arabia, Yemen and the UAE (Lopatin, 2008)

Epitrix dieckmanni Mohr, 1968

Plate 11

Specimens examined: Dibba, 1 ex., 21.iii.2007, sweep-net, FM & AS. Hatta, 1 ex., 30.i–26.ii.2006, LT, AvH. Khor al-Khwair, 6 ex., 8.iii–7.v.2007, LT, AvH. Near Mahafiz, 6 ex., 21–28.vi.2006, LT, AvH. Sharjah Desert Park, 31 ex., 2.iii–1.iv.2007, LT, AvH; 1 ex., 15–22.iv.2007, LT, AvH; 2 ex., 1–30.xi.2008, pitfall traps, AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–14.vi.2006, LT, AvH. Wadi Bih dam, 25 ex., 19.ii–30.iv.2008, LT, AvH; 1 ex., 25.iii.2010, KM. Wadi Safad, 12 ex., 21.ii–4.iii.2006, LT, AvH; 18 ex., 31.i–21.ii.2006, LT, AvH; 31 ex., 15–22.iv.2006, LT, AvH; 2 ex., 22.iv–21.vi.2006, LT, AvH. Wadi Shawkah, 2 ex., 26.iii.2007, FM & AS. Wadi Wurayah farm, 1 ex., 19.i–19.ii.2009, Malaise trap, AvH; 5 ex., 1.iv–14.vi.2009, LT, AvH.

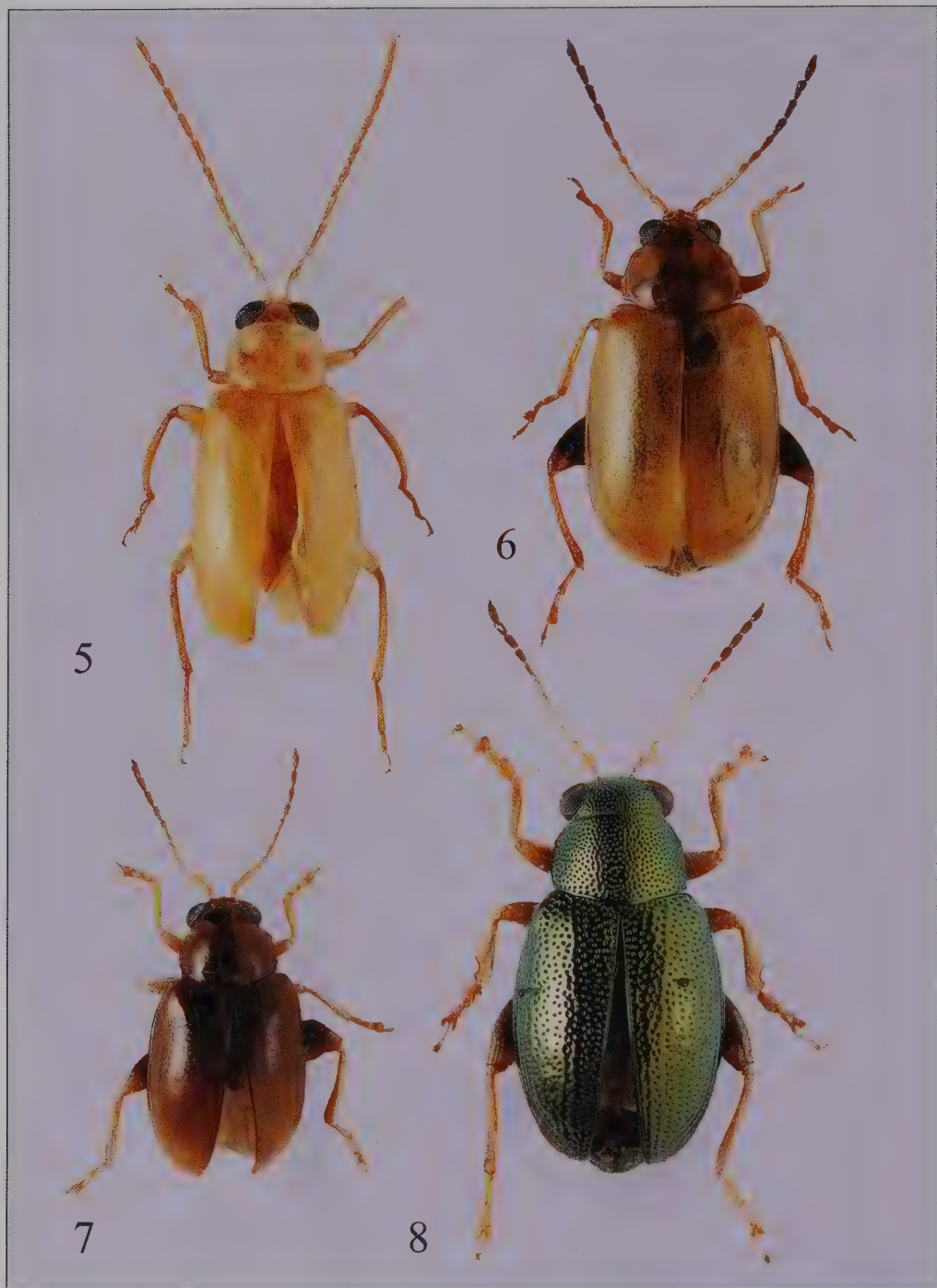
Distribution: Turkey, Iran, Turkmenistan, Israel, Jordan, Saudi Arabia, UAE (Lopatin, 2008).

Hermaeophaga ruficollis (Lucas, 1849)

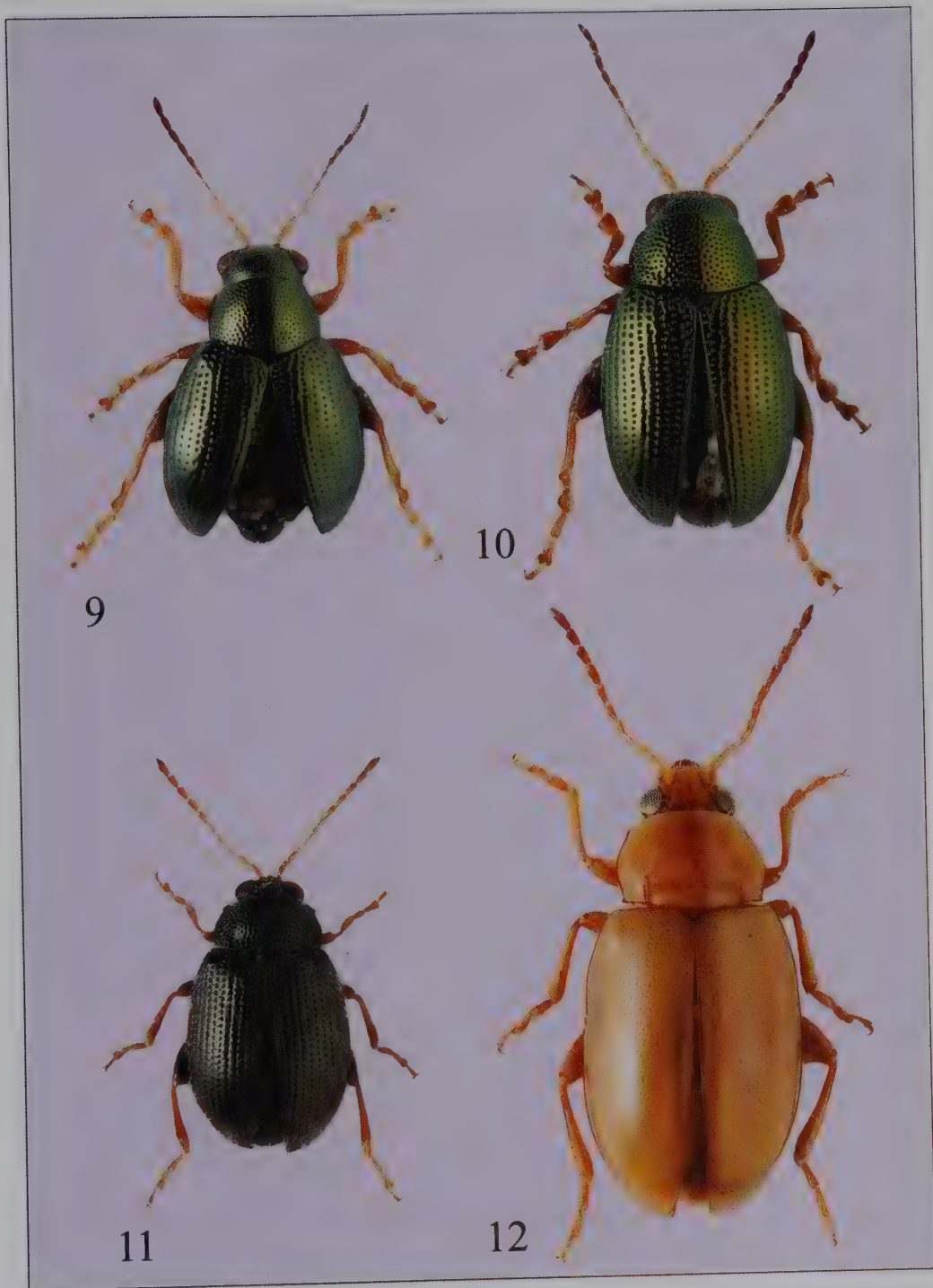
Plate 12

Specimens examined: Hatta, 2 ex., 17–24.v.2006, LT, AvH. Khor al-Khwair, 1 ex., 8.iii–7.v.2007, LT, AvH. Near Mahafiz, 1 ex., 2.ii–26.iv.2006, LT, AvH; 2 ex., 21–28.vi.2006, LT, AvH. Sharjah Desert Park, 3 ex., 2.iii–1.iv.2007, LT, AvH; 1 ex., 15–22.iv.2007, LT, AvH; 1 ex., 21–28.v.2007, LT, AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–14.vi.2006, LT, AvH; 4 ex., 24.iii.2010, KM. Wadi Bih dam, 10 ex., 25.iii.2010, KM. Wadi near Wadi al-Ejeli, 30 ex., 1–15.xi.2010, WT, AvH. Wadi Madaq, 3 ex., 27.iv–12.vi.2006, LT, AvH. Wadi Safad, 3 ex., 31.i–21.ii.2006, LT, AvH; 2 ex., 11.iii.2010, KM. Wadi Shawkah, 250–280 m, 1 ex., 20.iii.2007, JB; 4 ex., 26.iii.2007, FM & AS; 1 ex., 31.x–27.xi.2006, WT, AvH; 5 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 2 ex., 1.iv–14.vi.2009, LT, AvH.

Distribution: Widely distributed in southern Europe, North and West Africa, South-West Asia, India and Sri Lanka. In the Arabian Peninsula reported from Saudi Arabia, UAE (Lopatin, 2008), Oman and Yemen.



Plates 5–8. 5: *Nymphius emir* (Lopatin); 6: *Aphthona signatifrons* (Wollaston); 7: *Aphthona* spec.; 8: *Chaetocnema hortensis* (Geoffroy).



Plates 9–12. 9: *Chaetocnema ljuba* Bechyné; 10: *Chaetocnema wollastoni* Baly; 11: *Epitrix dieckmanni* Mohr; 12: *Hermaeophaga ruficollis* (Lucas).

***Longitarsus* (s. str.) spec. 1**

Plate 13

Specimens examined: Hatta, 2 ex., 30.i–26.ii.2006, LT, AvH; 1 ex., 17–24.v.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH. Wadi Bih dam, 1 ex., 16.xii.2009–8.iii.2010, WT, AvH. Wadi Hayl, 1 ex., 17.iv.2010, hand-collected, KM. Wadi Safad, 2 ex., 15–22.iv.2006, LT, AvH. Wadi Shawkah, 13 ex., 9.iv–24.vi.2007, WT, AvH.

Longitarsus (Testergus) spec. 2

Plate 14

Specimens examined: Wadi Madaq, 6 ex., 27.iv–12.vi.2006, LT, AvH. Wadi Shawkah, 2 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 2 ex., 19.i–19.ii.2009, Malaise trap, AvH; 8 ex., 1.iv–14.vi.2009, LT, AvH.

***Phyllotreta cheiranthi* Weise, 1903**

Plate 15

Specimens examined: Sharjah Desert Park, 8 ex., 2.iii–1.iv.2007, LT, AvH; 3 ex., 15–22.iv.2007, LT, AvH; 1 ex., 21–28.v.2007, LT, AvH. Wadi Bih dam, 1 ex., 19.ii–30.iv.2008, LT, AvH. Wadi Safad, 1 ex., 31.i–21.ii.2006, LT, AvH. Wadi Shawkah, 11 ex., 9.iv–24.vi.2007, WT, AvH.
Distribution: Egypt, Saudi Arabia, UAE (Lopatin, 2008), Oman and Yemen.

***Phyllotreta floriensis* Pic, 1910**

Plate 16

Specimen examined: Wadi Shawkah, 1 ex., 9.iv–24.vi.2007, WT, AvH.
Distribution: Egypt, Israel, Saudi Arabia, UAE (Lopatin, 2008).

***Phyllotreta peyerimhoffi* Heikertinger, 1941**

Plate 17

Specimens examined: Khor al-Khwair, 2 ex., 8.iii–7.v.2007, AH, LT. Sharjah, Wasit Protected Area, 1 ex., 7–21.ix.2010, WT, AvH. Sharjah Desert Park, 13 ex., 2.iii–1.iv.2007, LT, AvH. Wadi Bih dam, 1 ex., 22.ii–1.iii.2007, LT, AvH; 5 ex., 19.ii–30.iv.2008, LT, AvH; 1 ex., 25.iii.2010, KM. Wadi Madaq, 19 ex., 27.iv–12.vi.2006, LT, AvH; 5 ex., 26.x–9.xi.2006, WT, AvH. Wadi Safad, 2 ex., 31.i–21.ii.2006, LT, AvH; 2 ex., 15–22.iv.2006, LT, AvH; 1 ex., 22.iv–21.vi.2006, LT, AvH. Wadi Shawkah, 12 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 2 ex., 19.i–19.ii.2009, Malaise trap, AvH.
Distribution: Egypt, Jordan, Saudi Arabia, UAE (Lopatin, 2008).

***Phyllotreta tenuimarginata* Jacoby, 1899**

Plate 18

Specimens examined: Fujairah, 1 ex., 8.iv–10.vi.2006, LT, AvH. Hatta, 1 ex., 30.i–26.ii.2006, LT, AvH. Khor al-Khwair, 8 ex., 8.iii–7.v.2007, LT, AvH. Sharjah Desert Park, 22 ex., 2.iii–1.iv.2007, LT, AvH; 3 ex., 15–22.iv.2007, LT, AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–14.vi.2006, LT, AvH. Wadi Bih dam, 1 ex., 22.ii–1.iii.2007, LT, AvH; 3 ex., 25.iii.2010, KM. Wadi Madaq, 4 ex., 27.iv–12.vi.2006, LT, AvH; 1 ex., 12.v–15.vii.2006, LT, AvH. Wadi Safad, 1 ex., 15–22.iv.2006, LT, AvH; 1 ex., 21.ii–4.iii.2006, LT, AvH; 7 ex., 31.i–21.ii.2006, LT, AvH; 1 ex., 22.iv–21.vi.2006, LT, AvH. Wadi Shawkah, 2 ex., 20–23.iii.2007, colour pan traps, JB; 1 ex., 26.iii.2007, FM & AS. Wadi Wurayah farm, 6 ex., 1.iv–14.vi.2009, LT, AvH.
Distribution: Sudan, Somalia, Yemen, UAE (Lopatin, 2008).

***Psylliodes hospes* Wollaston, 1854**

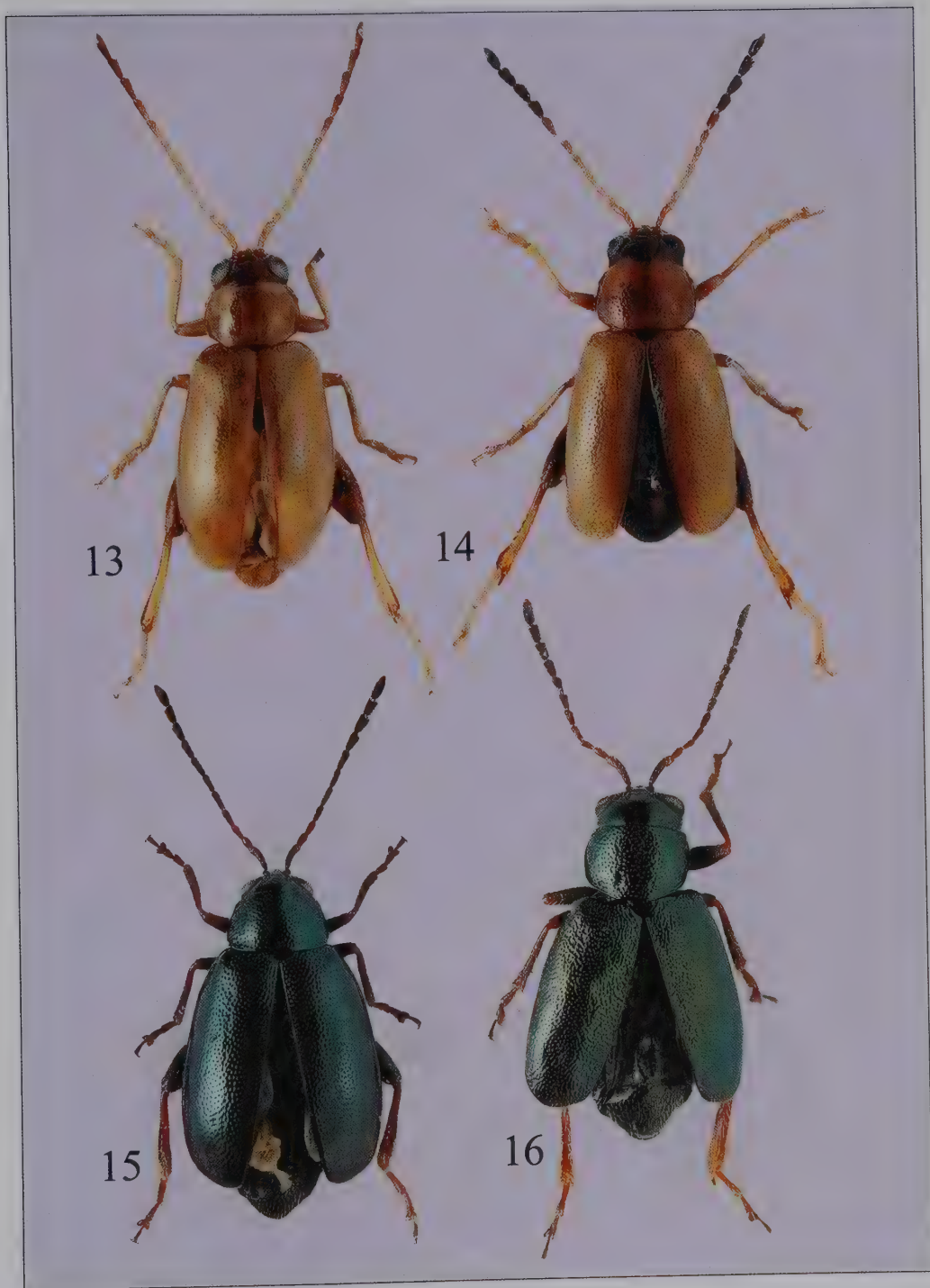
Plate 19

Specimens examined: Jebel Jibir, 1 ex., 27.iii.2007, AvH; 2 ex., 14.iv.2010, KM. Sharjah Desert Park, 2 ex., 2.iii–1.iv.2007, LT, AvH. Wadi Madaq, 5 ex., 27.iv–12.vi.2006, LT, AvH; 1 ex., 12.v–15.vii.2006, LT, AvH; 1 ex., 26.x–9.xi.2006, WT, AvH. Wadi Safad, 2 ex., 21.ii–4.iii.2006, LT, AvH. Wadi Shawkah, 2 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 1 ex., 1.iv–14.vi.2009, LT, AvH.
Distribution: Madeira, Canary Islands, Morocco, Algeria, Tunisia, France, Spain, Italy, Egypt, Israel, Saudi Arabia, UAE (Lopatin, 2008).

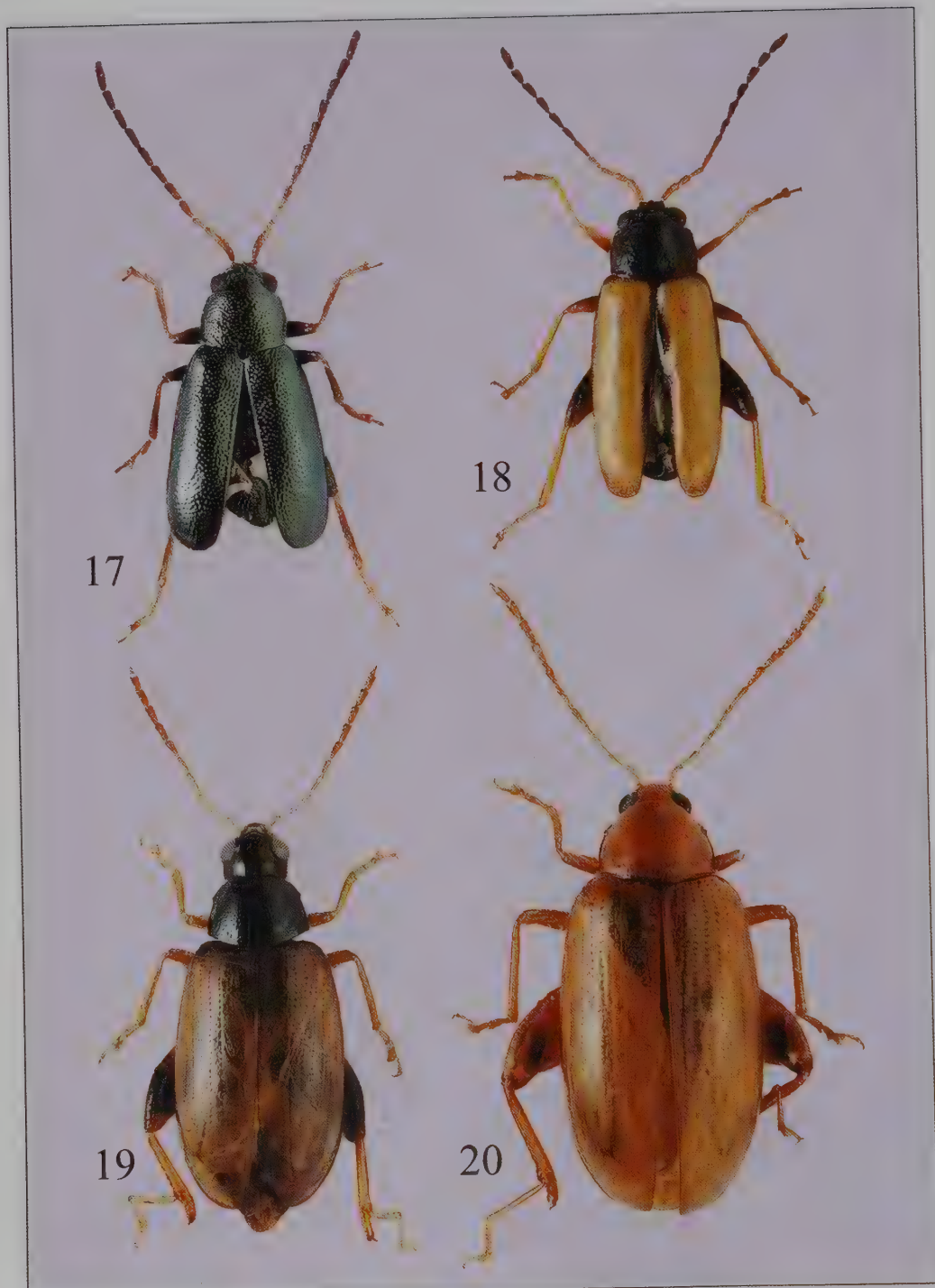
***Psylliodes maculatipes* Pic, 1924**

Plate 20

Specimens examined: Khor al-Khwair, 1 ex., 8.iii–7.v.2007, LT, AvH. Sharjah Desert Park, 2 ex., 2.iii–1.iv.2007, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 24.iii.2010, KM. Tawi as-Saman, 1 ex.,



Plates 13–16. 13: *Longitarsus* (s. str.) spec. 1; 14: *Longitarsus* (*Testergus*) spec. 2; 15: *Phyllotreta cheiranthi* Weise; 16: *Phyllotreta floriæni* Pic.



Plates 17–20. 17: *Phyllotreta peyerimhoffi* Heikertinger; 18: *Phyllotreta tenuimarginata* Jacoby; 19: *Psylliodes hospes* Wollaston; 20: *Psylliodes maculatipes* Pic.

16.iii.2007, JB & HP. Wadi Bih dam, 1 ex., 19.ii–30.iv.2008, LT, AvH; 1 ex., 25.iii.2010, KM. Wadi Madaq, 1 ex., 12.v–15.vii.2006, LT, AvH. Wadi Safad, 1 ex., 15–22.iv.2006, LT, AvH; 3 ex., 21.ii–4.iii.2006, LT, AvH; 1 ex., 22.iv–21.vi.2006, LT, AvH. Wadi Shawkah, 2 ex., 20–23.iii.2007, coloured pan traps, JB; 1 ex., 26.iii.2007, JB; 2 ex., 26.iii.2007, FM & AS; 10 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 1 ex., 1.iv–14.vi.2009, LT, AvH.

Remarks: Identified previously from the UAE as *Psylliodes peyerimhoffi moricandiae* Pic, 1925 (Lopatin, 2008). This taxon does not occur in the eastern part of the Arabian Peninsula and previous records from the Arabian Peninsula published by Doguet (1979), Medvedev (1996, 1997) and Lopatin (2008) refer to *P. maculatipes* (see Leonardi, 2007).

Distribution: Algeria, Egypt, Israel, Oman, Saudi Arabia, UAE.

***Psylliodes peyerimhoffi* Heikertinger, 1916**

Plate 21

Specimens examined: Jebel Jibir, 1380 m., 6 ex., 27.iii.2007, JB; 1 ex., 27.iii.2007, AvH. Khor al-Khwair, 1 ex., 8.iii–7.v.2007, LT, AvH. Sharjah Desert Park, 1 ex., 2.iii–1.iv.2007, LT, AvH. Wadi Bih dam, 7 ex., 22.ii–1.iii.2007, LT, AvH; 2 ex., 19.ii–30.iv.2008, LT, AvH. Wadi Wurayah farm, 2 ex., 1.iv–14.vi.2009, LT, AvH.

Distribution: Egypt, Israel, Saudi Arabia, UAE.

Subfamily **Cryptocephalinae** Gyllenhal, 1813

Tribe **Clytrini** Kirby, 1837

***Aetheomorpha seminigra pumilio* (Lacordaire, 1848)**

Plate 22, Figures 1–2

Specimens examined: Wadi Shawkah, 2 ex., 26.iii.2007, JB; 1 ex., 31.x–27.xi.2006, WT, AvH; 1 ex., 20.iii.2007, AvH.

Distribution: Afghanistan, Egypt, Ethiopia, Oman, Saudi Arabia, Sudan, Yemen. New to the UAE.

***Tituboea pindai* Bezděk nov. spec.**

Plates 23–25, Figures 3, 5–7

Specimens examined: Holotype: ♂, “U.A.E., FUJAIRAH, 27.3.2007, / Rus al Jibal Mts., Jebel Yibir, / N 25°39'00" E 56°07'20" / 1380 m a.s.l., F. Menzel lgt. [w, p]” (coll. National Museum Praha, Czech Republic). Paratypes: 1♀, “United Arab Emirates / Wadi Bih, 25.80 N 56.07 / E leg. Schmid-Egger / 11–19.III.2009 uae6 [w, p]” (coll. National Museum Praha, Czech Republic); 1♀, “United Arab Emirates, / S of Ra’s al-Khaimah, / 25.43N 55.52E, hand coll., / 29.03.2008, J. Bosák leg. [w, p]” (coll. Jan Bezděk); 1♀, “United Arab Emirates, / Wadi Madaq, / 27.iv.–12.vi.2006, light trap, / A. van Harten leg. [w, p]” (coll. Jan Bezděk); 1♂, “OMAN – north, Jabal Akhdar, / 600 m, Nizza 15 km North, / N23°00' E57°34' / 11.2.2007, Major leg. [w, p]” (coll. Jan Bezděk).

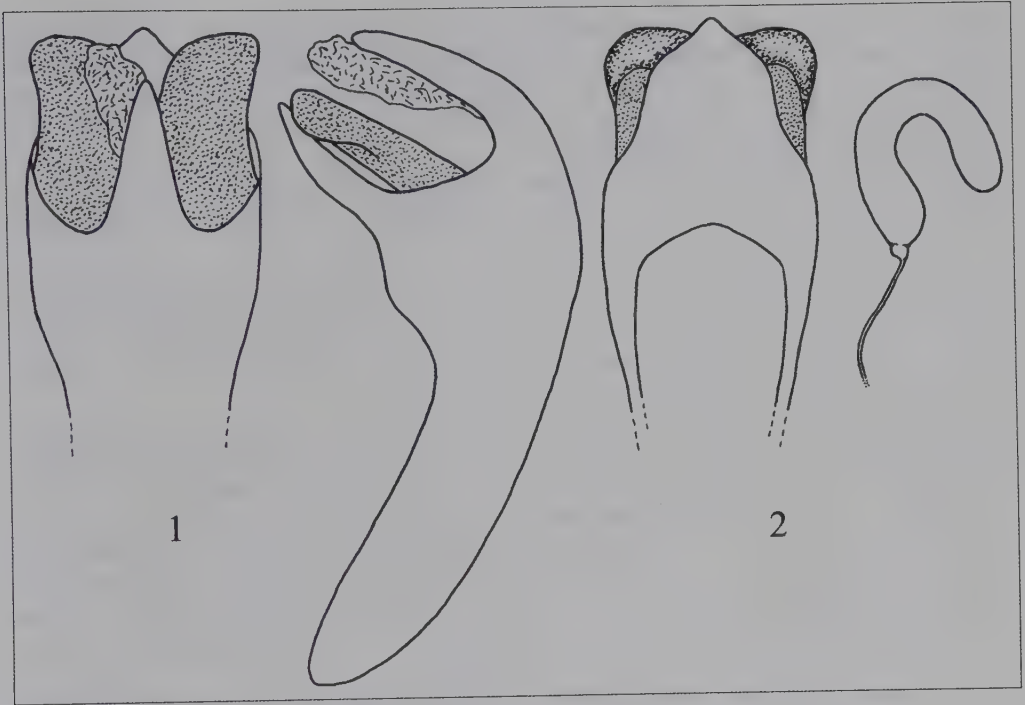
The specimens are provided with one additional printed red label: „HOLOTYPUS, [or PARATYPUS, resp.], / *Tituboea pindai* sp. n., / J. Bezděk det. 2010“.

Description: Measurements. Males: 5.75–6.05 mm (holotype: 5.75 mm); females: 5.60–6.55 mm.

Holotype (male, Plate 23): Head black. Mouthparts orange, the tips and small spot in the middle of basal margin of mandibles black. Labrum, anterior and lateral margins of clypeus and anterior margins of genae orange. Antennomeres 1 to 4 and the bases of antennomeres 5 to 7 orange, rest black. Pronotum orange, basal two thirds covered with a black band not touching lateral margin of pronotum (anterior margin of this band is irregular, in the middle incised). Scutellum black. Elytra orange, each elytron with 2 large black markings: oblique band in anterior third of elytron, not touching the lateral margin nor the suture; postmedian broad band connected at suture, but very narrowly separated from lateral margin of elytron. Legs orange, coxae black, basal half of outer side of meso- and metafemora distinctly



Plates 21-24. 21: *Psylliodes peyerimhoffi* Heikertinger; 22: *Aetheomorpha seminigra pumilio* (Lacordaire); 23-24: *Tituboea pindai* nov. spec. 23: Holotype male; 24: Paratype male from Oman.



Figures 1–2. *Aetheomorpha seminigra pumilio* (Lacordaire). 1: Aedeagus; 2: Spermatheca.

darkened. Prosternum orange, black behind procoxae. Meso-, metasternum and abdomen black. Mandibles and labrum moderately prolonged anteriorly. Lateral sides of mandibles semiopaque, densely covered with small punctures bearing pale setae, tips of mandibles lustrous, without punctures and setae. Labrum shortly transverse, anterior margin slightly shallowly incised, with row of several longer pale setae along anterior margin. Clypeus lustrous, almost impunctate and almost glabrous. Frons and vertex semiopaque, densely covered with small punctures and pale setae (setae slightly longer at vertex than in frons). Frons wide, 2.6 times as wide as the diameter of the eye, with shallow impression in the middle. Antennomere 1 clavate, antennomeres 2 and 3 very short, nearly globular, antennae distinctly serrated from segment 4 (antennomere 4 triangular and not so prolonged as the rest of antennomeres). Prothorax transverse, 1.85 times as wide as long, widest in the middle, moderately convex, lustrous, covered with two different punctuations – sparse larger punctures cover whole pronotum, smaller fine punctures covers mainly anterior two thirds of pronotum. Lateral margins regularly rounded, anterior margin concave, posterior margin nearly straight and distinctly thickened in the scutellar area. Anterior angles obtuse angulate with regularly rounded tip and with several short setae, posterior ones distinctly elevated, obtuse angulate. Lateral and posterior margins distinctly bordered, anterior margin bordered only laterally, in the middle part the border disappears. Scutellum triangular with rounded apex, lustrous, small punctures bearing setae cumulated anterolaterally, median stripe almost impunctate. Elytra cylindrical, 1.50–1.55 times as long as wide at humeral part, glabrous, lustrous, densely covered with small fine indistinct punctures disappearing in elytral apices.

Humeral calli well developed. Epipleurae wide in the first third of elytral length, then abruptly narrowed and gradually disappearing behind midlength of elytra. Metathoracic wings fully developed. Tarsi slender, not broader than in females. Fore legs prolonged, first protarsomere twice as long as the second, length ratio of protarsomeres 1 to 4: 40:20:13:19 (Fig. 6), protibiae distinctly curved before apex.

Ventral side densely covered with long pale setae. Abdomen flattened. Aedeagus (Fig. 3) with triangular apex, the tip bent downwards. Alae triangular with deep elongate depression on the middle.

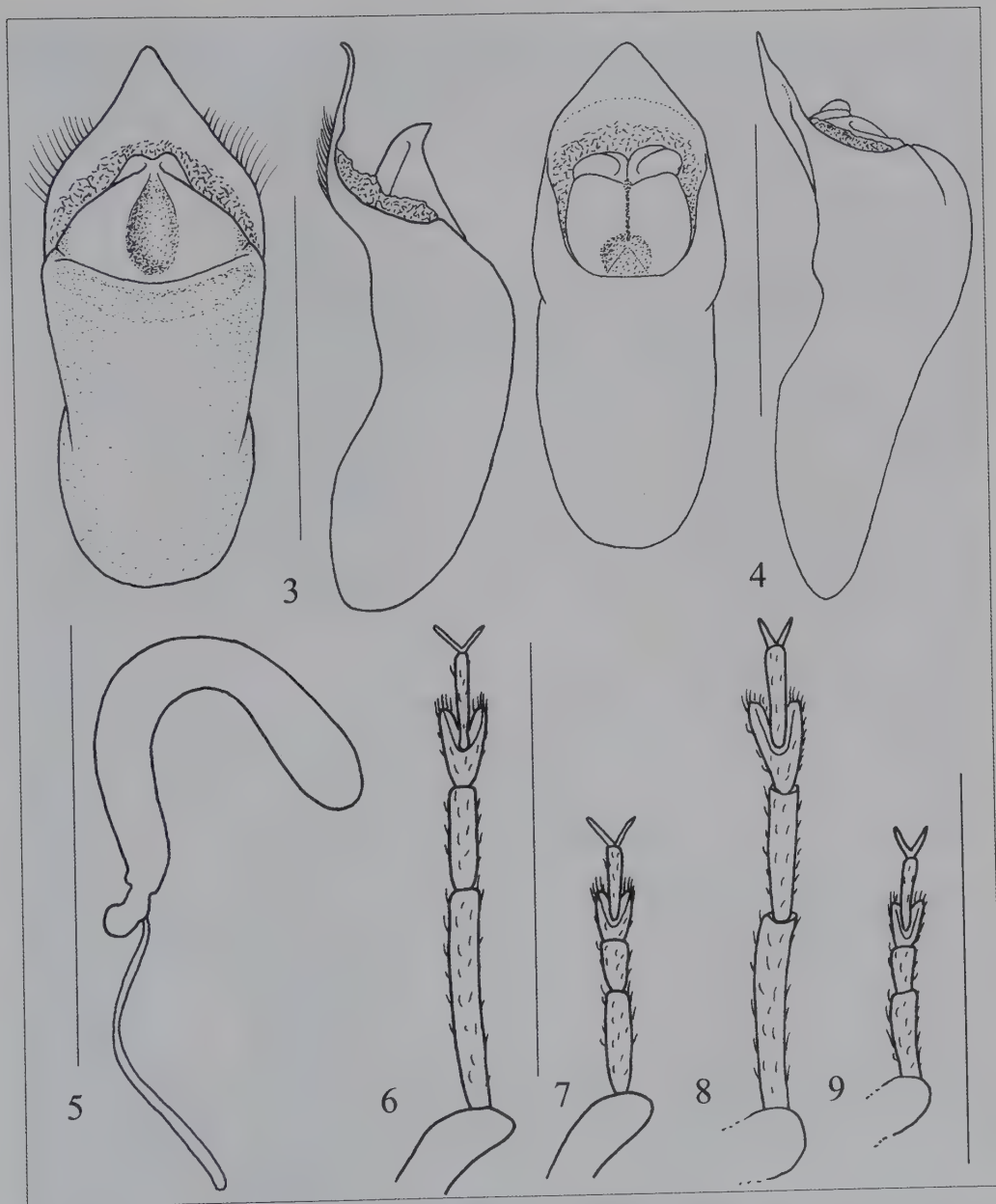
Female (Plate 25). Frons broader, 3.2 times as wide as the diameter of the eye. Prothorax transverse, 1.82 times as wide as long. Elytra 1.45 times as long as wide at humeral part. Protarsi much shorter than in males, length ratio of protarsomeres 1 to 4: 17:8:8:16 (Fig. 7). Abdomen robust, convex, last ventrite with a small round impression in the middle. Spermatheca widely C-shaped with well sclerotized ductus (Fig. 5).

Colour variability: All paratypes are paler specimens with reduced black pattern. Mandibles without small black spot in the middle of basal margin black. Clypeus with broader orange margination, also area around antennal insertions and complete genae orange. Pronotum with two irregular black spots near the basal margin. Male paratype from Oman (Plate 24) has also very small indistinct black spot in middle of basal margin. Black bands on elytra reduced to 4 black spots (two posterior spots sometimes touching). Legs orange, only coxae partly black. Differential diagnosis: As it is shown in variability of the newly described species, the size and the shape of the black spots on pronotum and elytra cannot be used for identification in the genus *Tituboea* but may help as an auxiliary character.

Tituboea pindai nov. spec. belongs to the group of species with elevated hind angles of pronotum and glabrous elytra. Within the fauna of the Arabian Peninsula and Iran it may be compared with *T. heptneri* Medvedev, 1957, *T. kermanica* (Medvedev, 1962), *T. ogloblini* (Medvedev, 1962), *T. filitarsis* (Lacordaire, 1848), *T. ahwasa* Lopatin, 1985, and *T. zarudnii* Lopatin, 2001. Most of the mentioned species (*T. heptneri*, *T. kermanica*, *T. filitarsis* and *T. ahwasa*) have protarsi in males shorter and the length ratio of the first and the second protarsomeres less than 2.0 (equal 2.0 in *T. pindai* nov. spec.). The length ratio of male protarsomeres is not specified in the original description of *T. zarudnii*, but it can be distinguished by different structure of aedeagus (see Lopatin 2001). The most similar species is *T. ogloblini*, with very similarly prolonged protarsi as in *T. pindai* nov. spec. (Figs. 6–9). Both species can be correctly distinguished only by the structure of aedeagus (Figs. 3–4).

Tituboea decemguttata Walker, 1871 described from Cairo, Egypt (Walker, 1871) is a questionable species. Unfortunately, the Lord's collection which included the type material by Walker from his 1871 paper is probably lost (Horn et al., 1990). I tried to find some type specimens of *T. decemguttata* in the institutions housing Walker's collection, but without success: The Natural History Museum, London (Shute, pers. comm., 2010), University Museum of Natural History, Oxford (Mann, pers. comm., 2010) and Museum Victoria, Melbourne (Marchand, pers. comm., 2010). The original description of *T. decemguttata* is uninformative. In the key by Medvedev (1996) it is discriminated by the colouration of head (orange with black band between eyes). However, the colouration of head is very variable in *Tituboea* species and the identification based on this character is problematic. I examined some specimens from Saudi Arabia and Yemen identified by Medvedev as *T. decemguttata*. However, this material is different from our new species. Although the identity of *T. decemguttata* is unclear, I do not believe it could occur also in south-eastern part of the Arabian Peninsula.

Distribution: UAE, Oman.



Figures 3–9. 3, 5–7: *Tituboea pindai* nov. spec. 3: Aedeagus; 5: Spermatheca; 6: Male protarsus; 7: Female protarsus. 4, 8–9: *Tituboea ogloblini* (Medvedev). 4: Aedeagus; 8: Male protarsus; 9: Female protarsus. Scales: 1 mm for Figs 3–4, 0.5 mm for Fig. 5 and 2 mm for Figures 6–9.

Etymology: Named after Hynek Pinda (Dubai, UAE), who kindly contributed and helped with organization of the collecting trips of the second author.

Tituboea spec.

Plates 26–27

Specimen examined: Jebel Hafit, Wadi Tarabat, 24°06'13"N 55°46'00"E, 1♀, 24.iii.2007, JB. Wadi Bih dam, 1♂, 19.ii–30.iv.2008, LT, AvH. Wadi Siji, 25°09'N 56°02'E, 1♀, 24.ix–22.x.2006, WT, AvH.

Subfamily **Cryptocephalinae** Gyllenhal, 1813Tribe **Cryptocephalini** Gyllenhal, 1813*Acolastus arabicus* (Lopatin, 1982)

Plates 28–29

Specimens examined: Jebel Jibir, 700 m., 1 ex., 28.ix.2007, JB. Khor al-Khwair, 1 ex., 8.iii–7.v.2007, LT, AvH. Near Mahafiz, 1 ex., 21–28.vi.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH. Wadi Bih dam, 1 ex., 22.ii–1.iii.2007, LT, AvH; 12 ex., 19.ii–30.iv.2008, LT, AvH; 2 ex., 13.xii.2009–8.iii.2010, WT, AvH; 1 ex., 25.iii.2010, KM. Wadi Hayl, 225 m, 5 ex., 5.x.2007, at light, JB & HP. Wadi Safad, 28 ex., 31.i–21.ii.2006, LT, AvH; 31 ex., 15–22.iv.2006, LT, AvH; 10 ex., 21.ii–4.iii.2006, LT, AvH.

Distribution: Oman, UAE (Lopatin, 2008).

Acolastus latifrons Lopatin & Nesterova, 2007

Plate 30

Specimens examined: Near Mahafiz, 1 ex., 21–28.vi.2006, LT, AvH. Wadi Wurayah farm, 1 ex., 1.iv–14.vi.2009, LT, AvH.

Distribution: Described and recorded so far only from the UAE (Lopatin & Nesterova, 2007; Lopatin, 2008).

Acolastus substriatus (Medvedev, 1996)

Plate 31

Specimens examined: Hatta, 1 ex., 30.i–26.ii.2006, LT, AvH. Dibba, 1 ex., 21.iii.2007, FM & AS. Near Mahafiz, 4 ex., 2.ii–26.iv.2006, LT, AvH; 16 ex., 21–28.vi.2006, LT, AvH. S of Ra's al-Khaimah, 1 ex., 5–6.iv.2008, KM. Wadi Bih dam, 15 ex., 19.ii–30.iv.2008, LT, AvH. Wadi Safad, 1 ex., 21.ii–4.iii.2006, LT, AvH; 25 ex., 15–22.iv.2006, LT, AvH; 1 ex., 22.iv–21.vi.2006, LT, AvH. Wadi Shawkah, 1 ex., 20.iii.2007, AvH; 1 ex., 9.iv–24.vi.2007, WT, AvH.

Distribution: Saudi Arabia, Yemen, Oman, UAE (Lopatin, 2008).

Acolastus wittmeri (Lopatin, 1979)

Plate 32

Specimens examined: Near Mahafiz, 1 ex., 21–28.vi.2006, LT, AvH. Wadi Bih dam, 12 ex., 19.ii–30.iv.2008, LT, AvH.

Distribution: Saudi Arabia, Yemen. New to the UAE.

Cryptocephalus chikatunovi Lopatin, 2008

Plate 33–34

Specimens examined: Sharjah-Khor Kalba, near tunnel, 1 ex., 28.iii–14.vi.2006, LT, AvH. Wadi Bih dam, 7 ex., 19.ii–30.iv.2008, LT, AvH. Wadi Hayl, 225 m, 3 ex., 28.iii.2007, JB; 3 ex., 28.iii.2007, FM & AS. Wadi Safad, 1 ex., 31.i–21.ii.2006, LT, AvH; 5 ex., 21.ii–4.iii.2006, LT, AvH; 7 ex., 15–22.iv.2006, LT, AvH. Wadi Shawkah, 282 m, 2 ex., 18.iii.2007, JB; 1 ex., 26.iii.2007, JB; 1 ex., 20.iii.2007, AvH.

Remarks: Specimens collected by JB were taken mostly on leaves and flowers of *Nerium*.

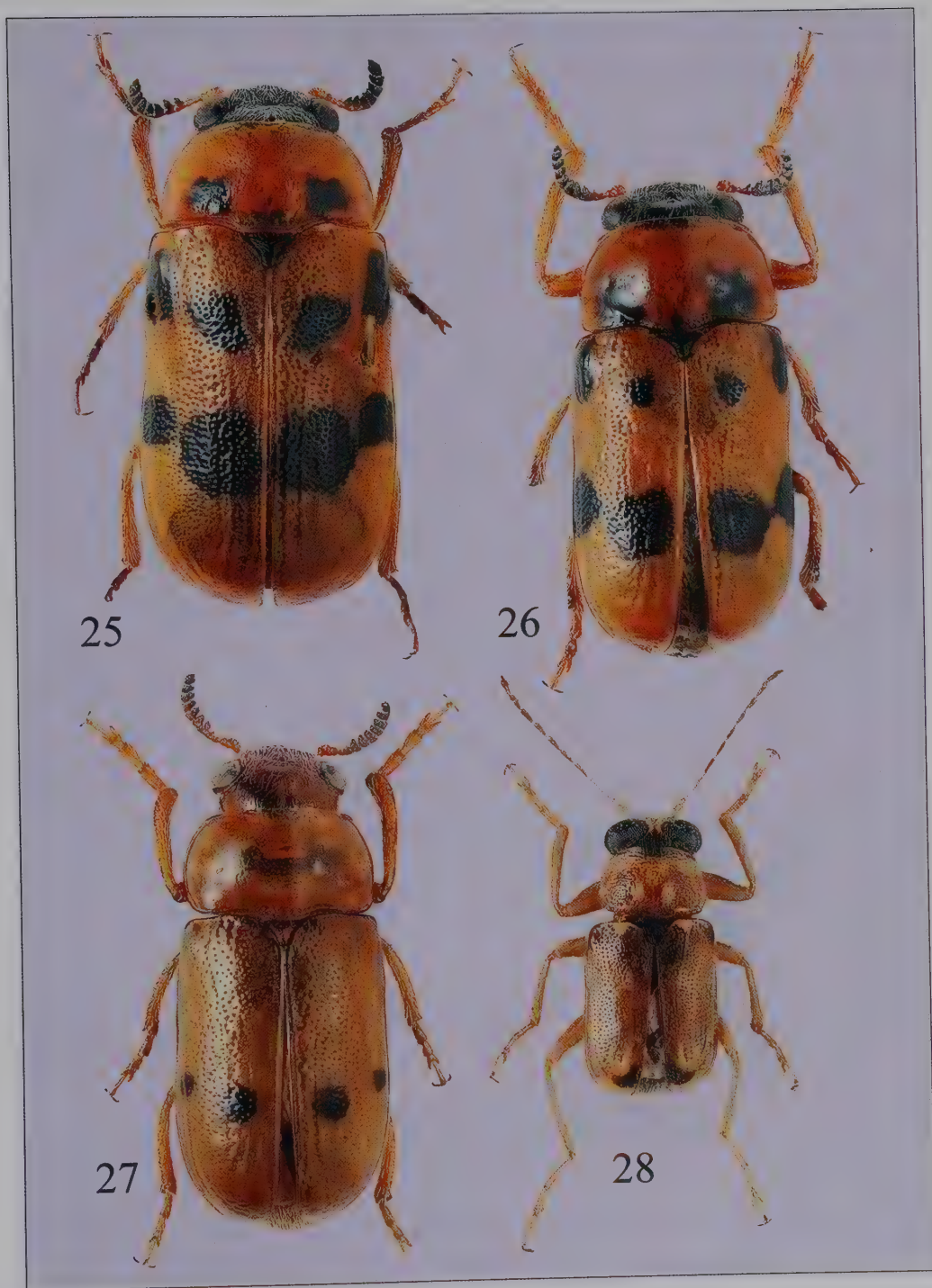
Distribution: Described and recorded so far only from the UAE (Lopatin, 2008).

Cryptocephalus dumonti Peyerimhoff, 1924

Plate 35, Figures 10–13

Specimen examined: Near Mahafiz, 1♂, 20.iii.2008, KM.

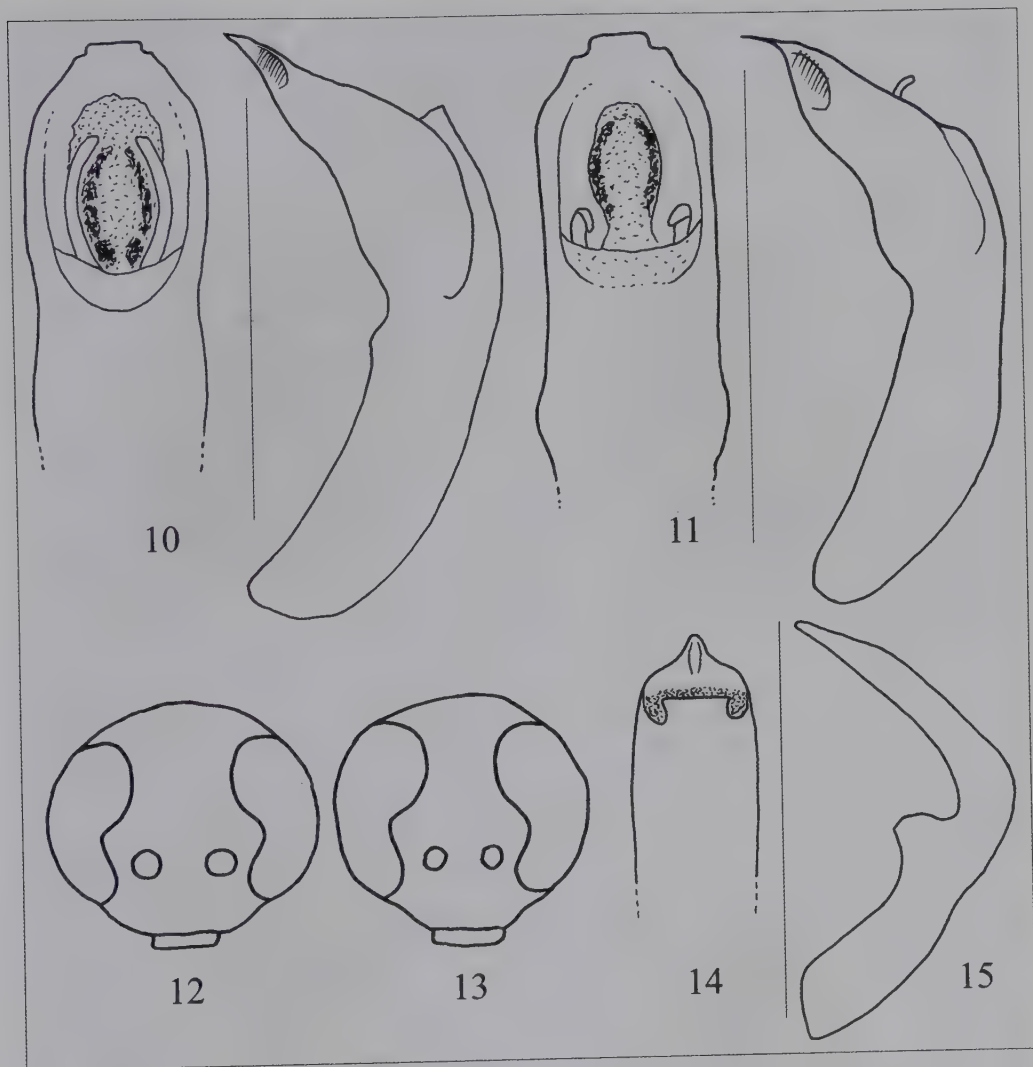
Remarks: The male collected in the UAE is in habitus identical with *C. dumonti*, but differs slightly in the structure of aedeagus (Figs. 10–11) and by the narrower interocular space (Figs. 12–13). Additional material is necessary to decide whether the population from the



Plates 25–28. 25: *Tituboea pindai* nov. spec., paratype female; 26–27: *Tituboea* spec. 26: Male 1; 27: Male 2; 28: *Acolastus arabicus* (Lopatin), male.



Plates 29–32. 29: *Acolastus arabicus* (Lopatin), female; 30: *Acolastus latifrons* Lopatin & Nesterova; 31: *Acolastus substriatus* (Medvedev); 32: *Acolastus wittmeri* (Lopatin).



Figures 10–15. 10–13: *Cryptocephalus dumonti* Peyerimhoff. 10–11: Aedeagus; 12–13: Head. (10, 12: male from Tunis; 11, 13: male from UAE). 14: *Chloropterius politus* Berti & Rapilly, aedeagus. 15: *Macrocoma vanharteni* Lopatin, aedeagus. Scales 1 mm.

UAE falls within the variability of *C. dumonti* or represents a new subspecies.

Distribution: *Cryptocephalus dumonti* is known from Algeria, Tunisia, Egypt and Israel.

Cryptocephalus omanicus Medvedev, 1996

Specimen examined: Dibba, 1 ex., 21.iii.2007, FM & AS.

Distribution: Oman. New to the UAE.

Plate 36

Melixanthus melanocephalus (Suffrian, 1857)

Specimen examined: Wadi Safad, 1 ex., 22.iv–21.vi.2006, LT, AvH.

Plate 37



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Plates 33–36. 33–34. *Cryptocephalus chikatunovi* Lopatin. 33: Male; 34: Female; 35: *Cryptocephalus dumonti* Peyerimhoff; 36: *Cryptocephalus omanicus* Medvedev.

Remarks: Recorded from the UAE by Lopatin (2008) as *M. granularis* (Suffrian, 1857), a synonym of the present species (see Warchalowski, 1999: 580)

Distribution: Lybia, Egypt, Jordan, Saudi Arabia, UAE, Transcaucasus, Turkmenistan

Subfamily **Eumolpinae** Hope, 1840

Chloropterus lefevrei arabicus Lopatin, 2008

Plate 38

Specimen examined: Khor al-Khwair, 1 ex., 8.iii–7.v.2007, LT, AvH. Wadi Bih dam, 1 ex., 24.iv–1.v.2007, LT, AvH; 1 ex., 13–24.vi.2008, LT, AvH.

Distribution: Described and recorded so far only from the UAE (Lopatin, 2008).

Chloropterus politus Berti & Rapilly, 1973

Plate 39, Figure 14

Specimens examined: Hatta, 20 ex., 17–24.v.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 9 ex., 7–14.vi.2006, LT, AvH. Wadi Shawkah, 250–280 m, 29 ex., 3.x.2007, at light, JB & HP.

Distribution: Iran, Oman. New to the UAE. The record from Saudi Arabia (Lopatin, 1983) was treated as erroneous by Medvedev (1996).

Eryxia coracina Lopatin, 1996

Plate 40

Specimens examined: Near Mahafiz, 1 ex., 21–28.vi.2006, LT, AvH. Wadi Bih dam, 1 ex., 22.iii.2007, JB; 12 ex., 24.iv–1.v.2007, LT, AvH; 5 ex., 19.ii–30.iv.2008, LT, AvH. Wadi Safad, 19 ex., 15–22.iv.2006, LT, AvH. Wadi Shawkah, 1 ex., 20–23.iii.2007, colour pan traps, JB; 2 ex., 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah farm, 1 ex., 19.i–19.ii.2009, Malaise trap, AvH; 1 ex., 1.iv–14.vi.2009, LT, AvH.

Distribution: Armenia, Bulgaria, Egypt, Libya, Iran, Israel, Jordan, Saudi Arabia, UAE, Yemen. New to the UAE.

Macrocoma vanharteni Lopatin, 2008

Plate 41, Figure 15

Specimens examined: N of Ajman, 1 ex., 16.ix–12.x.2006, WT, AvH. Ibn Rasheed village, near ad-Dhaid, (between roads 116 and 88), 1 ex., 23.ix.2007, JB & HP. Sharjah, Wasit Protected Area, 1 ex., 7–21.ix.2010, WT, AvH.

Remarks: The aedeagus (Fig. 15) was not illustrated in the original description

Distribution: Described and recorded so far only from the UAE (Lopatin, 2008).

Macrocoma zarudnii Lopatin, 1985

Plate 42

Macrocoma hormuziaca Warchalowski, 2001: 345, **nov. syn.**

Type material examined: *Macrocoma zarudnii*: 1 paratype (female): "Loc. No. 162 / Exp. Nat. Mus. / Praha [w, p] // SE Iran, 18 km / N Bazman / 13–14.4.1973 [w, p] // Paratypus [red label, p] // *Macrocoma* / *zarudnii* sp. n. [h] / det. I. Lopatin, 19 [p] 84 [w, h]"; 1 paratype (female): "SE Iran / Bazman / 13.4.73 [w, p] // Loc. no. 161 / Exp. Nat. Mus. / Praha [w, p] // Paratypus [red label, p] // *Macrocoma* / *zarudnii* sp. n. [h] / det. I. Lopatin, 19 [p] 82 [w, h]" (both paratypes deposited in National Museum Prague).

Macrocoma hormuziaca: 3 paratypes (2 males, 1 female), labelled: "IRAN (Hormozgan) / mts. Kuh-e-Biaban / 26°27' N, 57°38' E / 6–11.IV.2000 / leg. V. Siniaev et A. Plutenko [w, p] // specimen / Prague in mercatu / martii 2001 / coemptum [w, p] // *Macrocoma* / *hormuziaca* mihi / det. A. Warchalowski [w, p] // Paratypus [red label, p]" (deposited in Jan Bezděk's collection).

Additional specimens examined: Hatta, 2 ex., 30.i–26.ii.2006, LT, AvH. Wadi Hayl, 225 m, 7 ex., 28.iii.2007, JB. Wadi Madaq, 1 ex., 27.iv–12.vi.2006, LT, AvH. Wadi Safad, 125 m, 1 ex., 19.iii.2007, JB; 12 ex., 31.i–21.ii.2006, LT, AvH; 19 ex., 15–22.iv.2006, LT, AvH; 4 ex., 21.ii–4.iii.2006, LT, AvH.

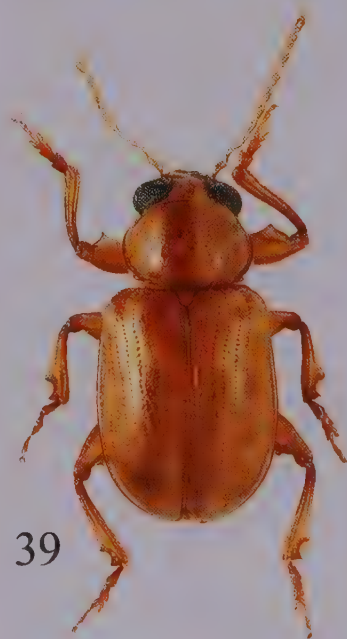
Distribution: Iran, UAE (Lopatin, 2008).



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Plates 37–40. 37: *Melixanthus melanocephalus* (Suffrian); 38: *Chloropterus lefevrei arabicus* Lopatin; 39: *Chloropterus politus* Berti & Rapilly; 40: *Eryxia coracina* Lopatin.

***Macrocoma* spec.**

Plate 43

Specimens examined: Al-Ain, near Jebel Hafit, 24°07'N 55°44'E, 5 ex., 21.x–16.xi.2009, pitfall traps, leg. V. Korshunov. Al-Ajban, 1 ex., 29.v–19.vi.2006, LT, AvH. S of Ra's al-Khaimah, 1 ex., 29.iii.2008, 25°43'N 55°52'E, leg. J. Bosák. Sharjah Desert Park, 9 ex., 2.iii–1.iv.2007, LT, AvH; 1 ex., 21–28.v.2007, LT, AvH; 3 ex., 25.v–15.vii.2008, LT, AvH; 1 ex., 1–30.xi.2008, pitfall traps, AvH.

***Microeurydemus semivittatus* (Jacoby, 1899)**

Plate 44

Specimens examined: Wadi Safad, 1 ex., 15–22.iv.2006, LT, AvH. Near Mahafiz, 1 ex., 21–28.vi.2006, LT, AvH.

Distribution: Chad, Somalia, Saudi Arabia, UAE (Lopatin, 2008), Yemen.

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Plates 41–44. 41: *Macrocoma vanharteni* Lopatin; 42: *Macrocoma zarudnii* Lopatin; 43: *Macrocoma* spec.; 44: *Microeurydemus semivittatus* (Jacoby).

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Authors' addresses:

J. Bezděk, Mendel University, Department of Zoology, Zemědělská 1, CZ-613 00 Brno, Czech Republic; e-mail: bezdek@mendelu.cz

J. Batelka, Nad vodovodem 16, CZ-100 00 Praha 10, Czech Republic; e-mail: janbat@centrum.cz

Order Coleoptera, family Chrysomelidae

Subfamily Bruchinae

Alex Delobel

INTRODUCTION

Bruchinae are commonly known as ‘seed beetles’ because their larval development takes place within the fruits and seeds of trees and herbaceous plants. Their main hosts are Leguminosae (Fabaceae or Papilionoideae), but a large number of other botanic families are also attacked (see Johnson, 1990; Kergoat et al., 2008). The seed beetle fauna of the Arabian Peninsula is relatively well known since the publications of Decelle (1979, 1990) and Anton (1994a, 1994b, 2000), dedicated to the Yemeni, Saudi Arabian and Omani faunas.

So far only one species of seed beetles, *Algarobius prosopis* (LeConte, 1858), had been recorded from the United Arab Emirates (Decelle, 1990). A large number of specimens were collected by A. van Harten and his colleagues at various localities if the UAE. This collection offers a singular opportunity to discover the fauna of this part of the Arabian Peninsula; it comprises a total of 897 specimens, belonging to 17 species. Two additional female specimens of *Bruchidius* could not be definitely identified.

MATERIALS AND METHODS

Most specimens have been collected using different kind of traps, mainly light traps, Malaise traps and water traps. The specimens studied are preserved in my private collection and in the UAE Arthropod Collection.

Abbreviations used in the text: LT = light trap, MT = Malaise trap, WT = water trap, PT = pitfall trap; NARC = National Avian Research Centre. If not otherwise stated, the specimens were collected by A. van Harten.

SYSTEMATIC ACCOUNT

Tribe **Pachymerini** Bridwell, 1929

Genus *Caryedon* Schönherr, 1823

Caryedon angeri (Semenov, 1896)

Plate 1

Specimens examined: Hatta, 3 ex., 4–11.iv.2006, LT. Khor al-Khwair, 1♂, 17–24.iv. 2007, LT; 5 ex., 2–13.v.2007, LT. Sharjah Desert Park, 1♂, 18.i–25.ii.2006, LT; 2♂, 1♀, 6–28.xii.2006, PT; 2♂, 15–22.iv.2007, LT; 1♂, 22–28.v.2007, LT; 4 ex., 20.x–24.xi.2007, LT.

Host plants: Reared from seeds of various species of *Acacia*, also from *Prosopis farcta* (Anton & Delobel, 2004)

Distribution: Algeria, Chad, Sudan, Egypt, Saudi Arabia, Oman, Israel, Jordan, Lebanon, Syria, Turkey. Iraq, Iran, Turkmenistan, Afghanistan, Pakistan. New to the UAE.

Caryedon gonagra (Fabricius, 1798)

Plate 2

Specimens examined: Al-Ajban, 1♀, 26.iii–4.iv.2006, MT; 2♂, 1♀, 2.x–22.xi.2006, MT; 5 ex., 27.xii.2006–18.ii.2007, MT. Fujairah, 2♂, 2♀, 1–8.iv.2006, LT. Hatta, 1♀, 4–11.iv.2006, LT. Sharjah

Desert Park, 2♂, 2♀, 6–28.xii.2006, PT; 1♀, 17.ii–3.iii.2007, LT; 1♀, 24.iii–1.iv.2007, LT; 1♂, 1♀, 24.xi–22.xii.2007, LT. Wadi Safad, 1♀, 21.ii–4.iii.2006, LT; 3♂, 15–22.iv.2006, LT.

Remarks: *Caryedon gonagra* used to be confused with the groundnut seed beetle, *Caryedon serratus* (Olivier, 1790) (Delobel et al., 2003). Its larvae feed in the seeds of various Caesalpinioideae, including tamarind (*Tamarindus indica*), *Gleditsia triacanthos*, *Senna didymobotrya* and various species of *Cassia* and *Bauhinia*; also reared from Mimosoid seeds: *Acacia farnesiana*, *A. tortilis raddiana*, *Dichrostachys cinerea*, possibly also *Prosopis juliflora*. Adult size varies widely according to the size of the seed in which larval development has taken place; specimens from UAE are usually very small as compared with specimens reared from tamarind or *Bauhinia*.

Distribution: From Egypt to Australia, including India, Sri Lanka, Thailand, Vietnam, and New Caledonia. New to the UAE.

***Caryedon nongoniermai* Anton & Delobel, 2004**

Plate 3

Specimens examined: Al-Ajban, 1♂, 10–17.x.2005, 1♀, LT & MT; 1♂, 22.x–9.xi.2005, MT; 1♀, 9.xi–7.xii.2005, LT & MT. Khor al-Khwair, 1♂, 17–24.iv.2007, LT. Near Mahafiz, 1♂, 2♀, 21–28.viii.2006, LT. Sharjah Desert Park, 5 ex., 21.x–24.xi.2007, LT. Sharjah-Khor Kalba, near tunnel, 7 ex., 31.v–7.vi.2006, LT; 14 ex., 7–14.vi.2006, LT. Wadi Safad, 1♂, 15–22.iv.2006, LT; 7 ex., 1–8.vii.2006, LT.

Host plants: Reared from several species of *Acacia*: *A. ehrenbergiana*, *A. kirkii*, *A. nilotica*, *A. senegal*, *A. seyal*, *A. sieberiana*, *A. tortilis raddiana* and *A. tortilis spirocarpa* (Anton & Delobel, 2004).

Distribution: Senegal, Mauritania, Morocco, Mali, Burkina Faso, Libya, Egypt, Israel, Jordan, Saudi Arabia, Yemen, Oman. New to the UAE.

***Caryedon sudanensis* Southgate, 1971**

Plate 4

Specimens examined: Hatta, 2♂, 2♀, 4–11.iv.2006, LT. Khor al-Khwair, 2♀, 2–13.v.2007, LT. Wadi Safad, 3♀, 15–22.iv.2006, LT.

Remarks: This species is closely related to *Caryedon yemenensis* Decelle, 1979, recorded from Egypt, Israel, Jordan, Iran, Pakistan, Saudi Arabia, Oman and Yemen (Decelle, 1979). The main difference between the two species is the presence of an additional pair of small sclerites in the internal sac in *C. yemenensis*; knowing that the number of smaller sclerites may vary in some *Caryedon* species (e.g. *C. pallidus* (Olivier, 1790), personal observation), it may be hypothesized that *yemenensis* is not more than a form of *sudanensis*.

Host plants: Reared from Caesalpinoid seeds, *Senna alexandrina* (Johnson et al., 2004) and *Cassia angustifolia* (Delobel & Tran, 2003).

Distribution: Algeria, Somalia, Djibouti, Eritrea, Sudan. New to the UAE.

Tribe Amblycerini Bridwell, 1832

Genus *Spermophagus* Schönherr, 1833

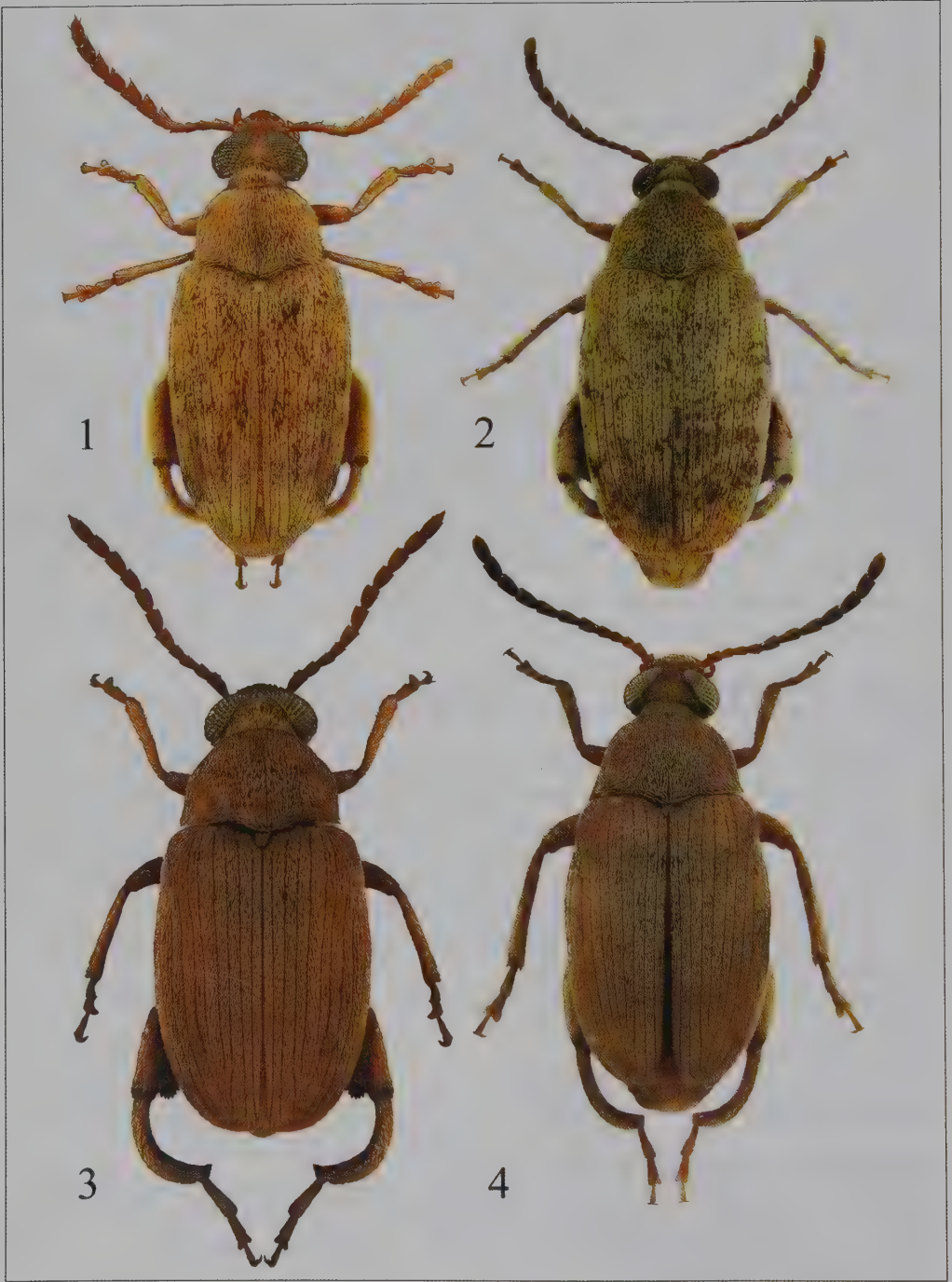
***Spermophagus humilis* Decelle, 1970**

Plate 5

Specimens examined: Wadi Madaq, 3♂, 2♀, 21.xii.2005–2.iii.2006, LT. WT. Wadi Wurayah farm, 2♂, 1♀, 19.i–19.ii.2009, MT.

Host plants: No known host plant. Most known *Spermophagus* species develop in seeds of Convolvulaceae or Malvaceae.

Distribution: Widely distributed in Africa (Senegal, Zambia, Namibia, Burundi, Tanzania, Kenya, Sudan), also recorded from Oman and Pakistan (Anton, 1994b; Wendt, 1997). New to the UAE.



Plates 1–4. 1: *Caryedon angeri* (Semenov), male, 3.5 mm; 2: *Caryedon gonagra* (Fabricius), female, 4.5 mm; 3: *Caryedon nongoniermai* Anton & Delobel, male, 4.5 mm; 4: *Caryedon sudanensis* Southgate, female, 4.5 mm.

***Spermophagus pubiventris* Baudi, 1866**

Plate 6

Specimens examined: Wadi Wurayah farm, 3♂, 1♀, 19.i–19.ii.2009, MT.

Host plants: No known host plant.

Distribution: Greece (Rhodes and Crete), Turkey, Lebanon, Israel and Jordan. Specimens from the UAE have brown to black hind tibial spines, a feature shared by their close European relatives *S. kuesteri* Schilsky, 1905, and *S. sericeus* (Geoffroy, 1785). First record from the Arabian Peninsula.

Tribe **Bruchini** Latreille, 1802Genus ***Algarobius*** Bridwell, 1946***Algarobius prosopis* (LeConte, 1858)**

Plate 7

Specimens examined: Hatta, 1♂, 4–11.iv.2006, LT. Khor al-Khwair, 2–13.v.2007, LT. Near Mahafiz, 12 ex., 19–26.iv.2006, LT; 1♀, 24–30.v.2006, LT; 2♀, 3♂, 21–28.viii.2006, LT. Sharjah, 33♂, 10♀, 12–28.vi.2005, LT; 5♂, 1♀, 28.vi–23.vii.2005, LT; 7 ex., 24.ix–9.x.2005, LT.

Remarks: *A. prosopis* is native to Mexico and southern USA, where it is known to feed in various *Prosopis* species (Kingsolver, 2004). It was introduced into South Africa, the Arabian Peninsula and Australia as a biocontrol agent against invasive *Prosopis* species noxious to native vegetation (Tuda, 2007; Anonymous, 2007). *A. prosopis* was recorded from Dubai, Yemen, and Saudi Arabia by Decelle (1990), and from Oman by Anton (1994). It was reared in Egypt from *Prosopis juliflora* and *P. glandulosa* (Delobel & Fédère, 2002), also collected in 2002 in Southern India by D. Roguet (unpublished data).

Genus ***Bruchidius*** Schilsky, 1905***Bruchidius atrolineatus* (Pic, 1921)**

Plate 8

Specimens examined: Hatta, 1♀, 4–11.iv.2006, LT. Near Mahafiz, 3♂, 21–28.viii.2006, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 1–8.iii.207, LT.

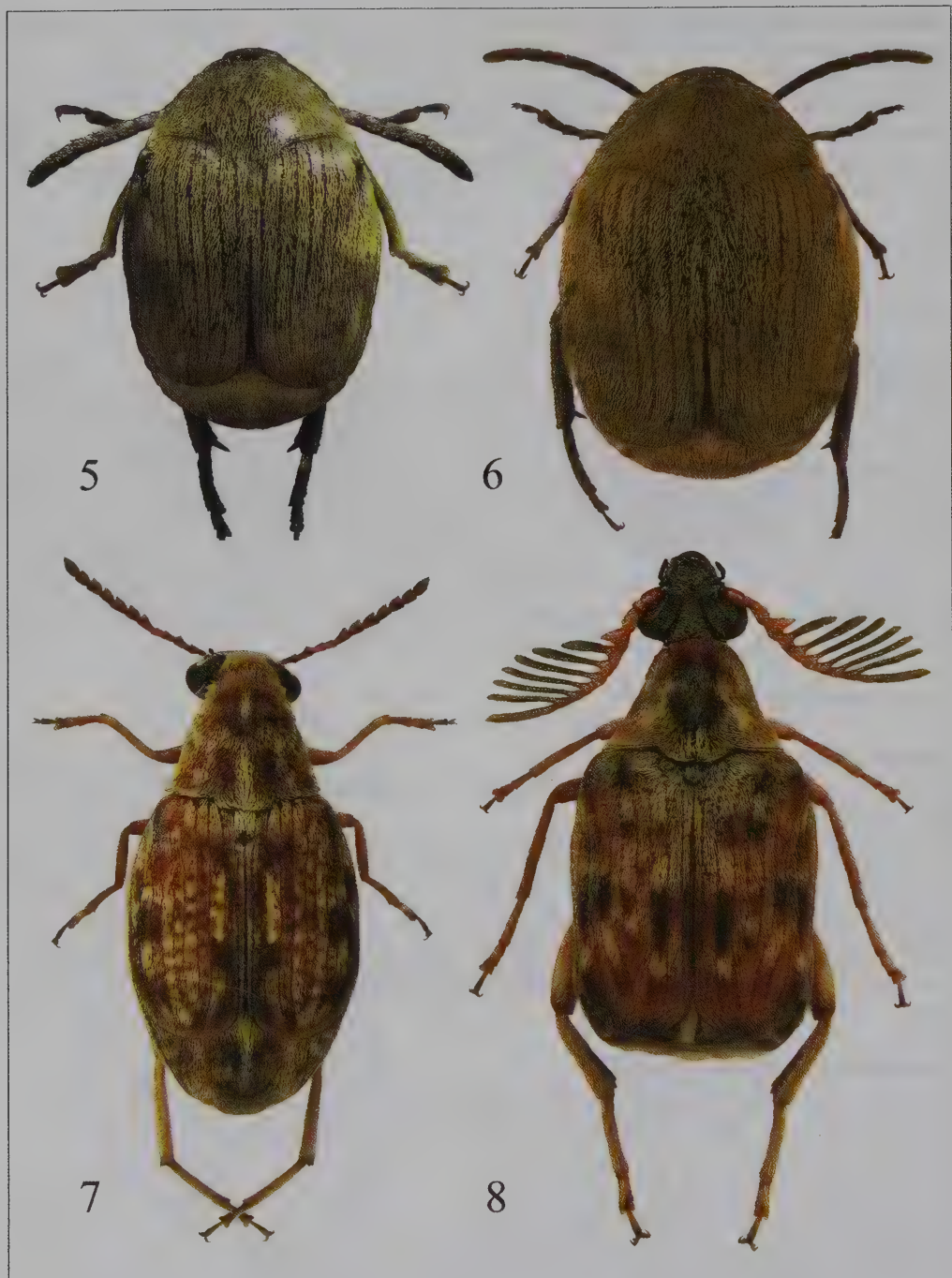
Host plants: *B. atrolineatus* commonly develops in *Vigna unguiculata* (cowpea) seeds in Africa, but it may also infest *V. radiata* (mung bean) and *Cicer arietinum* (chickpea) under laboratory conditions (Ofuya & Credland, 1996).

Distribution: Widely distributed in Africa, recorded from Senegal, Benin, Mali, Niger, Nigeria, Congo, Angola, Chad, Uganda, Kenya, Ethiopia, Sudan, Egypt. Also in Saudi Arabia and Yemen. Accidentally introduced to Brazil and Jamaica (K.-W. Anton, in litt.). New to the UAE.

***Bruchidius buettikeri* Decelle, 1979**

Plate 9

Specimens examined: Al-Ajban, 3♀, 10–17.x.2005, LT & MT; 9 ex., 22.x–9.xi.2005, MT; 11 ex., 9.xi–7.xii.2005, LT & MT; 1♂, 3♀, 7–28.xii.2005, LT & MT; 1♂, 28.xii.2005–29.i.2006, LT & MT; 2♀, 6–22.v.2006, LT; 1♂, 2♀, 27.v–26.vi.2006, LT; 1♀, 27.xii.2006–18.ii.2007, MT. Fujairah, 1♂, 1♀, 1–8.iv.2006, LT. Hatta, 2♂, 2♀, 4–11.iv.2006, LT; 3 ex., 11–26.iv.2006, LT. Khor al-Khwair, 1♂, 1♀, 17–24.iv.2007, LT; 1♀, 24.iv–2.v.2007, LT; 15 ex., 2–13.v.2007, LT. Near Mahafiz, 1♂, 1♀, 19–26.iv.2006, LT; 3♂, 3♀, 21–28.viii.2006, LT. Sharjah Desert Park, 2♂, 18.i–25.ii.2006, LT; 1♂, 2♀, 6–28.xii.2006, PT; 1♂, 1♀, 24.iii–1.iii.2007, LT. Sharjah-Khor Kalba, near tunnel, 1♀, 7–22.iii.2006, LT; 2♂, 2♀, 24–31.v.2006, LT; 1♂, 1♀, 31.v–7.vi.2006, LT; 1♂, 2♀, 7–14.vi.2006, LT. Wadi Safad, 5 ex., 20.xii.2005–2.i.2006, LT; 3♀, 5♂, 31.i–21.ii.2006, LT; 9 ex., 21.ii–4.iii.2006, LT; 9 ex., 15–22.iv.2006, LT; 2 ex., 1–8.vii.2006, LT; 2♀, 28.iii.2007, with sweepnet, leg. F. Menzel. Wadi Shawkah, 5 ex., 31.x–27.xi.2006, WT. Wadi Wurayah, 1♂, iii–iv.2007, WT, leg. C. Tourenq.



Plates 5–8. 5: *Spermophagus humilis* Decelle, male, 1.7 mm; 6: *Spermophagus pubiventris* Baudi, male, 2.0 mm; 7: *Algarobius prosopis* (LeConte), female, about 3.0 mm; 8: *Bruchidius atrolineatus* (Pic), male, about 3.0 mm.

Host plants: Reared from seeds of *Acacia gerrardii negevensis* and *Acacia tortilis raddiana* in Israel (Anton et al., 1997).

Distribution: Somalia, Yemen, Oman, Saudi Arabia, Jordan, Israel. New to the UAE.

***Bruchidius fulvus* (Allard, 1883)**

Specimens examined: Sharjah Desert Park, 1♂, 20.x–24.xi.2007, LT.

Remarks: The species is rather poorly known, and quite variable in colour. The single male from UAE is particularly dark, with elytra and last visible tergite (pygidium) entirely black. According to Allard's original description, *B. fulvus* is reddish brown, except apical antennal segments and tarsi. Some Egyptian and Iranian specimens reared from *Alhagi* spp. show this colour pattern, but other specimens of the same samples are as dark or even darker than the Emirati specimen. Male genitalia are quite distinctive, with a large, sub-oval, basal sclerite and a median comma-shaped sclerite; ventral valve acutely triangular; terminal strut subtriangular, with a small but well defined keel.

Host plants: Three hosts records, namely *Alhagi graecorum*, *Alhagi maurorum* and *Taverniera aegyptiaca* are undisputable; other records, including *Glycyrrhiza* spp., need confirmation.

Distribution: Greece (Rhodes), Libya, Egypt, Jordan, Israel, Turkey, Iran, Pakistan. First record of this species from the Arabian Peninsula.

***Bruchidius medaniensis* (Decelle, 1982)**

Plate 10

Specimens examined: Al-Ajban, 1♂, 27.v–26.vi.2006, LT. N of Ajman, 98♂, 2♀, 1.ii–16.iii.2009, WT. Wadi Madaq, 1♂, 21.xii.2005–2.iii.2006, LT. Wadi Shawkah, 1♂, 9.iv–24.vi.2007, WT. Wadi Wurayah farm, 1♂, 19.i–19.ii.2009, MT

Host plants: Unknown.

Distribution: Kenya, Sudan. First record of this African species from the Arabian Peninsula.

***Bruchidius nalandus* (Pic, 1927)**

Plate 11

Specimens examined: Khor al-Khwair, 1♂, 24.iv–1.v.2007, LT. Near Mahafiz, 5♂, 2♀, 21–28.viii.2006, LT. Sharjah, 1♂, 28.vi–23.vii.2005, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 31.v–7.vi.2006, LT; 1♂, 7–14.vi.2006, LT. Wadi Madaq, 1♂, 14–25.i.2006, WT; 1♂, 1–8.vii.2006, LT. Wadi Safad, 5 ex 20.xii.2005–2.i.2006, LT; 6♂, 3♀, 31.i–21.ii.2006, LT; 14 ex., 21.ii–4.iii.2006, LT; 43♂, 1♀, 15–22.iv.2006, LT; 2♂, 1–8.vii.2006, LT.

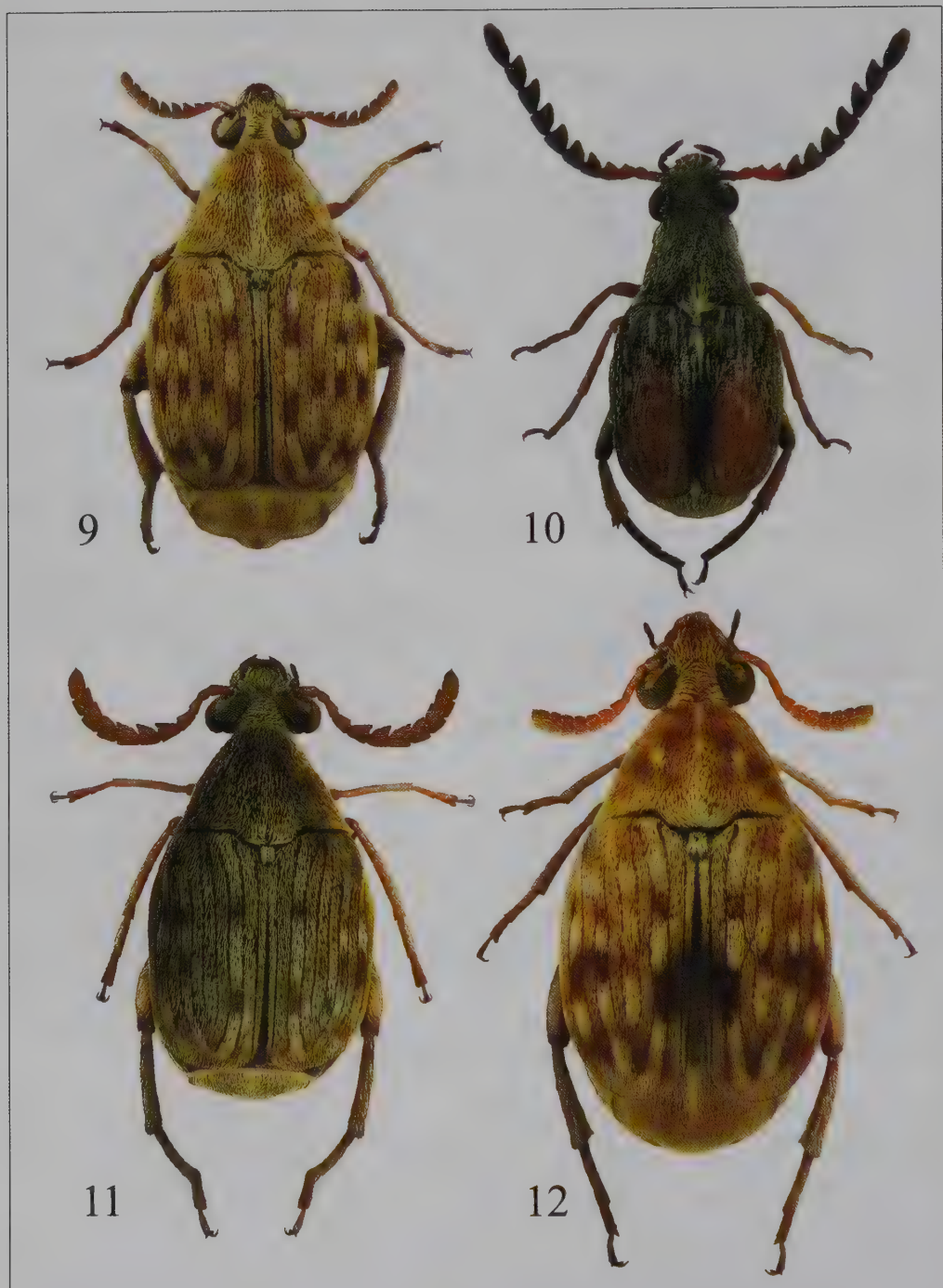
Host plants: Reared in India from *Tephrosia purpurea* (Arora, 1977), in Indonesia from *T. candida* (Decelle, 1975); also in Vietnam from *T. purpurea* and *Crotalaria pallida* (unpublished data).

Distribution: Congo, Republic of South Africa, Kenya, Iran, India, Sri-Lanka, Vietnam, Indonesia. First record of the species from the Arabian Peninsula.

***Bruchidius raddianae* Anton & Delobel, 2003**

Plate 12

Specimens examined: Al-Ajban, 6♂, 22♀, 10–17.x.2005, LT & MT; 56 ex., 22.x–9.xi.2005, MT; 13♂, 12♀, 9.xi–7.xii.2005, LT & MT; 6 ex., 28.xii.2005–29.i.2006, LT & MT; 5 ex., 6–22.v.2006, LT; 2♂, 27.v–26.vi.2006, LT; 1♀, 2.x–22.xi.2006, MT. Hatta, 2♂, 4–11.iv.2006, LT. Khor al-Khwair, 1♀, 17–24.iv.2007, LT; 4♂, 3♀, 24.iv–2.v.2007, LT; 10 ex., 2–13.v.2007, LT. Near Mahafiz, 15 ex., 19–26.iv.2006, LT; 1♂, 24–30.v.2006, LT; 1♂, 1♀, 21–28.viii.2006, LT. Sharjah Desert Park, 1♂, 18.i–25.ii.2006, LT; 1♂, 4♀, 6–28.xii.2006, PT; 1♂, 24.iii–1.iv.2007, LT; 4♂, 2♀, 15–22.iv.2007, LT; 1♂, 21–28.v.2007, LT; 4♂, 1♀, 20.x–24.xi.2007, LT; 4 ex., 24.xi–22.12.2007, LT. Sharjah-Khor Kalba, near tunnel, 5 ex., 31.v–7.vi.2006, LT. NARC, near Sweihan, 10 ex., 16.xi–21.xii.2005, LT. Wadi Madaq, 2♀, 14–25.i.2006, WT; 1♀, 7–14.iii.2006, WT. Wadi Safad, 2♂, 3♀, 31.i–21.ii.2006, LT; 3 ex., 15–22.iv.2006, LT. Wadi Tarabat, 2♂, 24.v.2007, with sweepnet, leg. F. Menzel & A. Stark.



Plates 9–12. 9: *Bruchidius buettikeri* Decelle, female, 4.5 mm; 10: *Bruchidius medaniensis* (Decelle), male, 1.5 mm; 11: *Bruchidius nalandus* (Pic), female, 2.2 mm; 12: *Bruchidius raddianae* Anton & Delobel, female, about 4.0 mm.

Remarks: Formerly known as *Bruchidius sahelicus* Decelle, 1979, nomen nudum.

Hosts plants: Include various species of *Acacia* (Mimosoideae), of which *A. tortilis raddiana* is probably the commonest. The mimosoid *Dichrostachys cinerea*, sometimes mentioned in the list of larval hosts of *A. raddianae*, should be excluded from that list (Delobel, 2010).

Distribution: This is one of the commonest seed beetle species in all arid and subarid regions of Africa and Southern Asia, from Senegal and Morocco to Sri Lanka. New to the UAE.

***Bruchidius skaipei* (Pic, 1928) nov. status**

Plate 13

Bruchus obscurus var. *skaipei* Pic, 1928. – Revue Scientifique du Bourbonnais: 681.

Specimens examined: Wadi Safad, 1♂, 28.iii.2007, with sweepnet, leg. F. Menzel.

Host plants: Reared by B. Le Rü in Kenya from *Indigofera tinctoria* pods. *B. skaipei* belongs to a large group of African species that develop in the larval stage within the seeds and pods of various Indigoferae (Delobel & Le Rü, 2010).

Distribution: Zimbabwe, Tanzania, Kenya. First record of this species from the Arabian Peninsula.

***Bruchidius uberatus* (Fahraeus, 1839)**

Plate 14

Specimens examined: Hatta, 1♂, 4–11.iv.2006, LT.

Host plants: Its main host is *Acacia nilotica*, but it has been reared from six additional *Acacia* species (Ernst et al., 1990).

Distribution: A common member of the fauna of African savannas. Described from the Bahr el Abiad (White Nile) region, it is probably present in all African countries. In Asia it has been recorded from Yemen, Qatar, Iran and India. New to the UAE.

Genus *Callosobruchus* Pic, 1902

***Callosobruchus analis* (Fabricius, 1781)**

Plate 15

Specimens examined: Sharjah Desert Park, 1♀, 6–28.xii.2006, PT.

Remarks: May be distinguished from *C. maculatus* thanks to its brighter colours, and the lack of a spine on internal carina of posterior femora.

Host plants: It is a common enemy of stored pulses in Southern and South-East Asia. Quite similar to *B. maculatus*, it frequently attacks cowpea (*Vigna unguiculata*) seeds, but also a number of edible peas in the genera *Vigna*, *Lablab*, *Lens*, *Pisum*, *Glycine*, both in the field and in stores (Delobel & Tran, 1993).

Distribution: Widely distributed in tropical Asia, it is also recorded from East Africa, Madagascar and Mauritius. This is the first record from the Arabian Peninsula.

***Callosobruchus cherenensis* Pic, 1939**

Plate 16

Callosobruchus omanicus Anton, 1994 nov. syn.

Specimens examined: Al-Ajban, 1♂, 25.vii–19.ix.2006, MT.

Host plants: No known host plant.

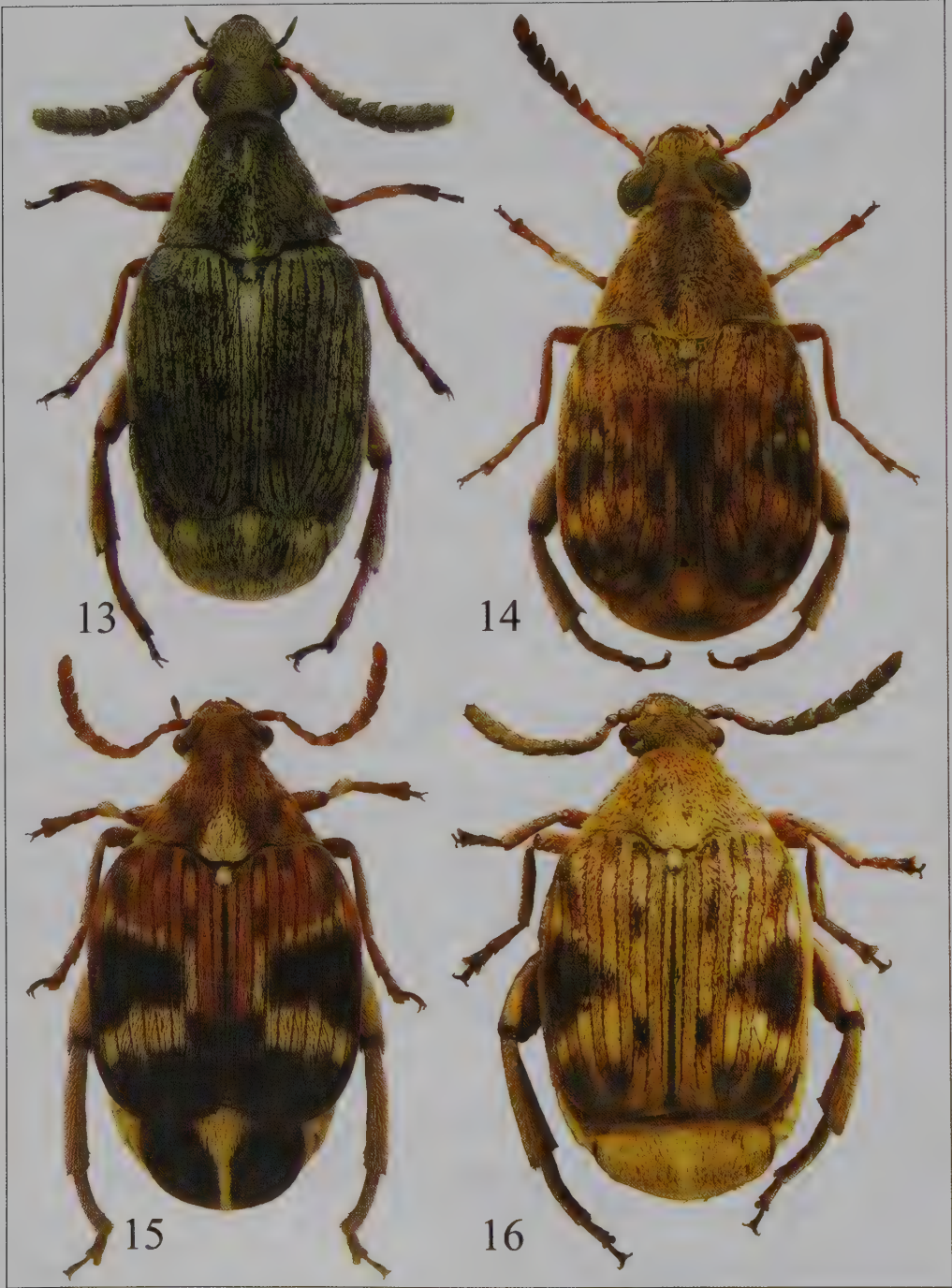
Distribution: Senegal, Eritrea. Also reported from Oman as *Callosobruchus omanicus* Anton, 1994, nov. syn. (Anton, pers. commun.). New to the UAE.

***Callosobruchus maculatus* (Fabricius, 1775)**

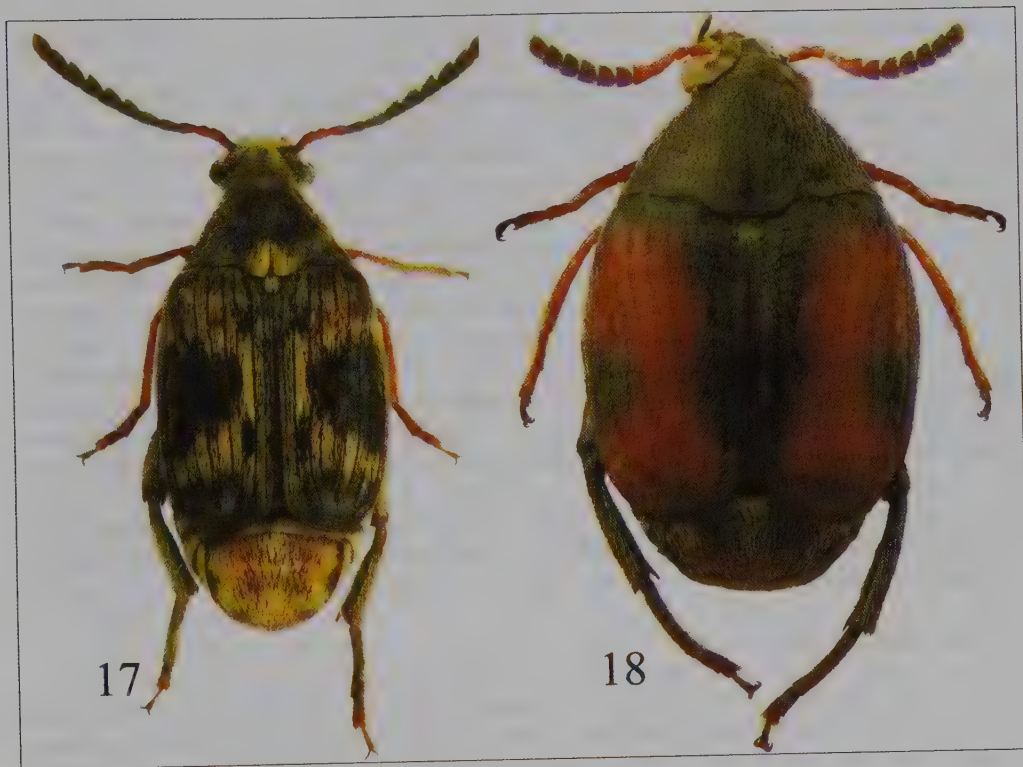
Plate 17

Specimens examined: Near Mahafiz, 2♂, 19–26.iv.2006, WT. Sharjah, 1♂, 12–28.vi.2005, LT.

Host plants: Stored pulses harbour a particular form, the so-called 'normal' form, which is smaller and more brightly coloured than the 'active', wild form. The three Emirati specimens belong to the latter, being larger and of a duller coloration (Delobel & Tran, 1993).



Plates 13–16. 13: *Bruchidius skaipei* (Pic), male, about 3.0 mm; 14: *Bruchidius uberatus* (Fahraeus), male, 4.5 mm; 15: *Callosobruchus analis* (Fabricius), female, 4.0 mm; 16: *Callosobruchus cherenensis* Pic, male, 4.0 mm.



Plates 17–18. 17: *Callosobruchus maculatus* (Fabricius), male, 3.0 mm; 18: *Stator limbatus* (Horn), female, 2.5 mm.

Distribution: Cosmopolitan species of Asian origin. New to the UAE.

Genus *Stator* Bridwell, 1946

***Stator limbatus* (Horn, 1873)**

Plate 18

Specimens examined: Fujairah, 1♂, 1♀, 1–8.iv.2006, LT. Hatta, 2 ex., 4–11.iv.2006, LT. Near Mahafiz, 3 ex., 19–26.iv.2006, LT; 1♀, 24–30.v.2006, LT. Sharjah, 158 ex., 12–28.vi.2005, LT; 1♂, 3♀, 28.vi–23.vii.2005, LT; 5 ex., 24.ix–9.x.2005, LT. Sharjah Desert Park, 3♀, 20.x–8.xi.2005, LT; 3 ex., 18.i–25.ii.2006, LT. Sharjah-Khor Kalba, near tunnel, 4 ex., 7–14.vi.2006, LT. Wadi Wurayah, 2♂, 10–26.xii.2006, WT.

Host plants: *S. limbatus* has one of the widest diet breadths of all Bruchinae. It feeds in the seeds of various Mimosoideae in the genera *Acacia*, *Albizia*, *Cercidium*, *Leucaena*, *Pithecellobium*, and others.

Distribution: This American seed beetle is distributed from the Southern United States to Ecuador, also occurring in Hawaii (Kingsolver, 2004). It was apparently introduced accidentally into the Middle East towards the end of the 20th century, with a record from Oman as early as 1994, then from Yemen (K.-W. Anton, in litt.); observed in 2008 in Southern Iran by H. Borumand (pers. commun.). New to the UAE.

DISCUSSION

The Emirati fauna of Bruchinae appears relatively poor, a situation that is obviously correlated with the comparatively low diversity of their host plants in the study area. Five species are true Ethiopian elements; two of them (*B. uberatus*, *B. atrolineatus*) have a wide Afrotropical distribution; and three (*Caryedon sudanensis*, *Bruchidius medaniensis*, *B. skaipei*) are East African elements. Seven species (*Callosobruchus cherenensis*, *Caryedon angieri*, *C. gonagra*, *C. nongoniermai*, *Spermophagus humilis*, *Bruchidius buettikeri*, *B. raddianae*) have a wide saharo-sahelian distribution, and are recorded from Northern Africa as well as Asia. *B. nalandus* has probably the widest geographic range, with an Afrotropical and Asian distribution, while *B. fulvus* is typically a West Asian species; they feed on the seeds of a limited number of hosts having a wide (*B. nalandus*) or more restricted (*B. fulvus*) distribution. *S. pubiventris* belongs to the East Mediterranean fauna. Two species, *Callosobruchus analis* and *C. maculatus*, are cosmopolitan pests of stored pulses of Oriental origin, whereas *Stator limbatus* and *Algarobius prosopis* are New World species developing in recently introduced Leguminous trees.

Seven species are recorded for the first time from the Arabian Peninsula: *Bruchidius fulvus*, *B. medaniensis*, *B. nalandus*, *B. skaipei*, *Callosobruchus analis*, *C. cherenensis*, and *Spermophagus pubiventris*.

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I am greatly indebted to K.-W. Anton (Germany), B. Le Rü, D. Roguet (France) and H. Borumand (Iranian Research Institute of Plant Protection, Tehran) for the communication of insects and original, unpublished data. My most sincere thanks to H. Perrin and Th. Deuve, curators of the Coleoptera collection, Muséum national d'Histoire naturelle, Paris.

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Author's address:

A. Delobel, 47, avenue Paul-Langevin, F 92260 Fontenay-aux-Roses, France; e-mail: delobel.alex@aliceadsl.fr

Order Hymenoptera, family Braconidae

The subfamily Agathidinae from the United Arab Emirates, with a review of the fauna of the Arabian Peninsula

Cornelis van Achterberg

INTRODUCTION

The biology of most species of the moderately large subfamily Agathidinae Nees, 1814, is unknown, but in general agathidines are koinobiont endoparasitoids of larvae of Lepidoptera. The species with a short ovipositor select exposed larvae and those with a long ovipositor use larvae with a concealed way of life. The Agathidinae from the Arabian Peninsula remained largely unstudied and, consequently, no reliable keys to the species are available. For the United Arab Emirates the East Mediterranean and Central Asian fauna is important (together with the West Oriental fauna, only one species of Agathidinae from the Afrotropical region reaches the area). For some genera (*Therophilus* (as *Bassus* s.l.), *Bassus* s.s. and *Agathis*) modern keys are available for the East Mediterranean area (Simbolotti & van Achterberg, 1992, 1995), but keys are lacking for the other areas or are out-dated (e.g. Bhat & Gupta, 1977). For Yemen the Afrotropical region is the most important region; there are no keys available, except for the fauna of Madagascar (Granger, 1949).

Tony van Harten brought together the largest known collection of the subfamily from the Arabian Peninsula originating from many localities in the UAE and Yemen. This paper is an attempt to give an overview of the diversity of the subfamily in the Arabian Peninsula, with special reference to the UAE, but obviously several genera and species remain to be discovered. For the first time all available species of the area are illustrated by colour photographs and keys are supplied if more than one species occurs in the Arabian Peninsula. Fourteen new species are described and illustrated: *Agathis luteotegula* nov. spec.; *A. melanotegula* nov. spec.; *Camptothlipsis brevantennatum* nov. spec.; *C. fuscistigmalis* nov. spec.; *C. luteostigmalis* nov. spec.; *Coccygidium maculatum* nov. spec.; *C. rugiferum* nov. spec.; *Disophrys angitemporalis* nov. spec.; *D. punctifera* nov. spec.; *Lytopylus brevitarsis* nov. spec.; *Therophilus breviscutum* nov. spec., *T. longiscutum* nov. spec., *T. nigrator* nov. spec. and *T. sulciferus* nov. spec. *Cremnops monochroa* Szépligeti, 1913, is reported for the first time from the Arabian Peninsula (Yemen). The following new synonyms are proposed: *Baeognatha* Kokujev, 1903, with *Agathis* Latreille, 1804; *Neophylax snyderi* Ashmead, 1900, and *Xanthomicrodus iridipennis* Cameron, 1904, with *Coccygidium luteum* (Brullé, 1846) and *Cremnops frustalis* Nixon, 1956, with *Cremnops monochroa* Szépligeti, 1913. A lectotype is designated for *Microdus? ambiguus* Kohl, 1906. *Agathis turanica* (Kokujev, 1903), *Coccygidium fraudator* (Szépligeti, 1913), *C. melleum* (Roman, 1910), *Therophilus barbieri* (Simbolotti & van Achterberg, 1992) and *T. triangularis* (Szépligeti, 1914) are new combinations.

MATERIALS AND METHODS

The specimens are mostly deposited in the United Arab Emirates Invertebrate Collection and in the collection of the Netherlands Centre for Biodiversity Naturalis, Leiden.

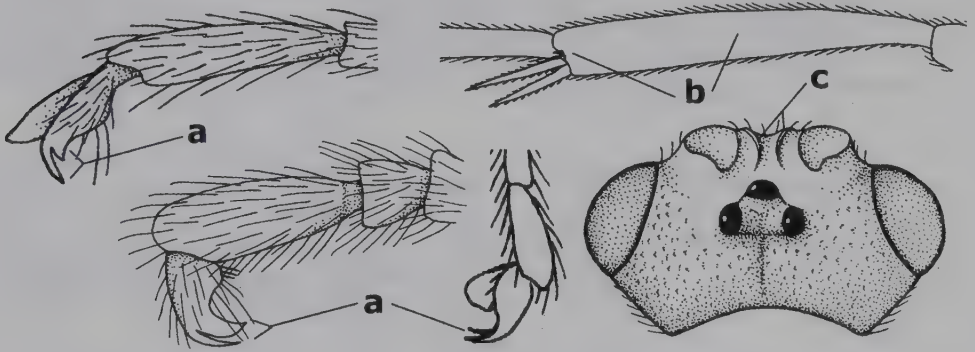
For the terminology used in this paper, see van Achterberg (1988, 1993), for identification of the subfamily Agathidinae, see van Achterberg (1993, 1997) and for the existing literature, see Yu et al. (2008).

Abbreviations used: RMNH = Netherlands Centre for Biodiversity Naturalis, Leiden; UAE = United Arab Emirates; AvH = leg. A. van Harten; LT = light trap; MT = Malaise trap; WT = water traps. NARC = National Avian Research Centre.

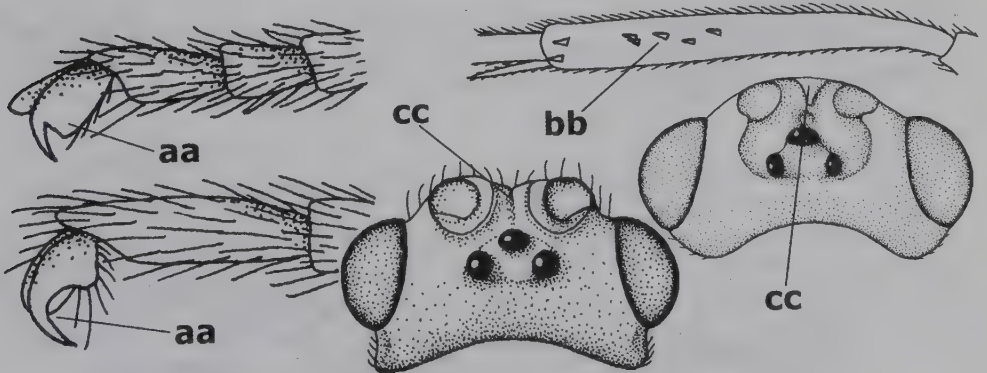
SYSTEMATIC ACCOUNT

Key to Arabian genera of the subfamily Agathidinae Haliday, 1833

- 1 Fore tarsal claws bifurcate, its inner tooth usually large and no lobe (a); outer face of middle tibia only with apical pegs (b); area between antennal sockets with a pair of crests or carinae (c), rarely with a trough (cc) or tubercle 2

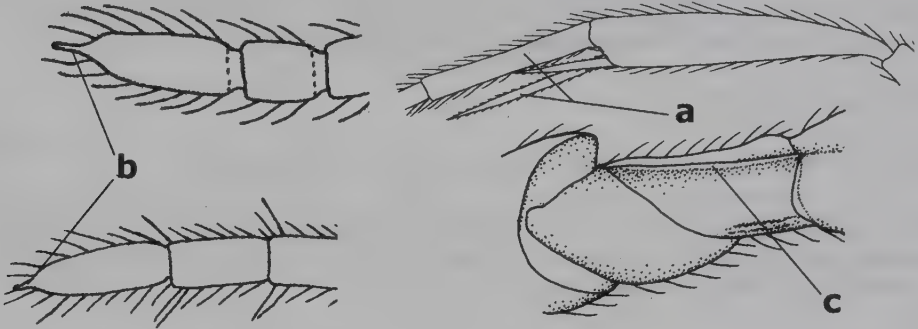


- Fore tarsal claws simple or with a more or less lamelliform, submedial lobe (aa); outer face of middle tibia with pegs submedially or pegs in a subapical cluster (bb); area between antennal sockets usually with a simple median elevation or with a trough (cc) .. 7

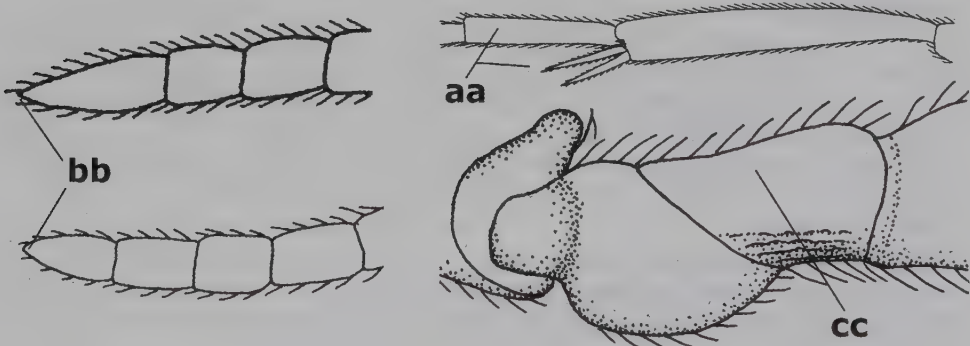


- 2 Inner spur of middle tibia 0.8–1.1 times as long as middle basitarsus (a); apex of antenna with short to medium-sized spine (b), sometimes minute; ovipositor sheath short, about as long as apical height of metasoma, hardly or not protruding; hind trochantellus usually

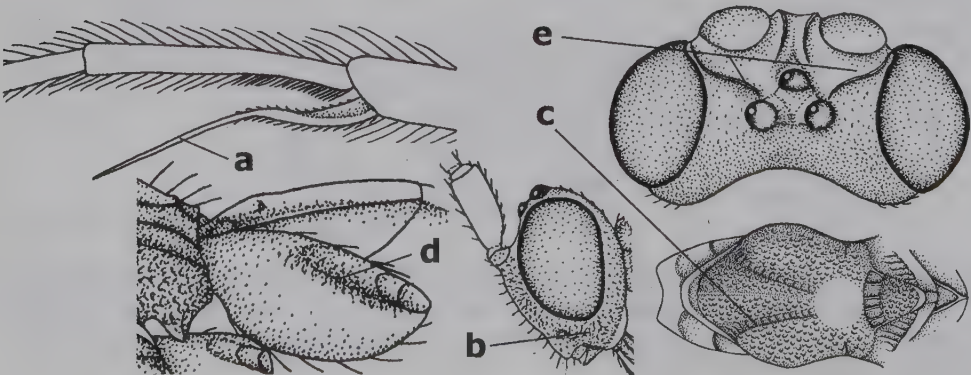
with a distinct ventral carina on its outer edge (c) or edge distinctly angulate; [apex of the ovipositor sheath blunt apically and with numerous ampulliform papillae]; *Coccygidium* complex 3



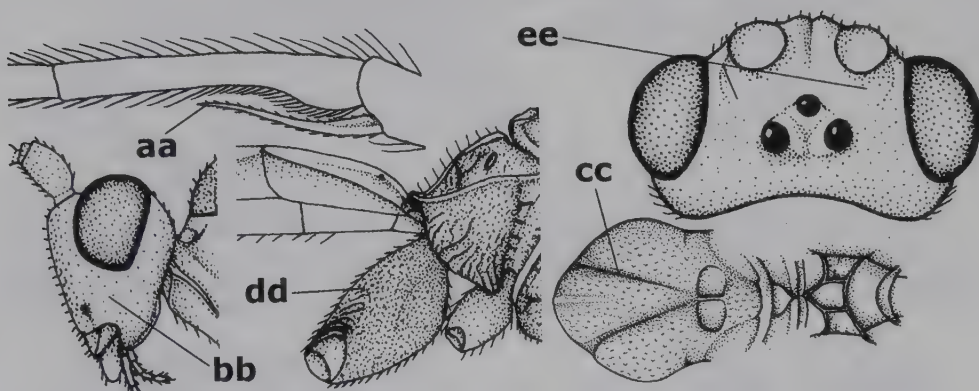
– Inner spur of middle tibia 0.4–0.7 times as long as middle basitarsus (aa); apex of antenna without spine (bb); relative length of ovipositor sheath variable; ventral carina of hind trochantellus often absent or obsolescent (cc) 4



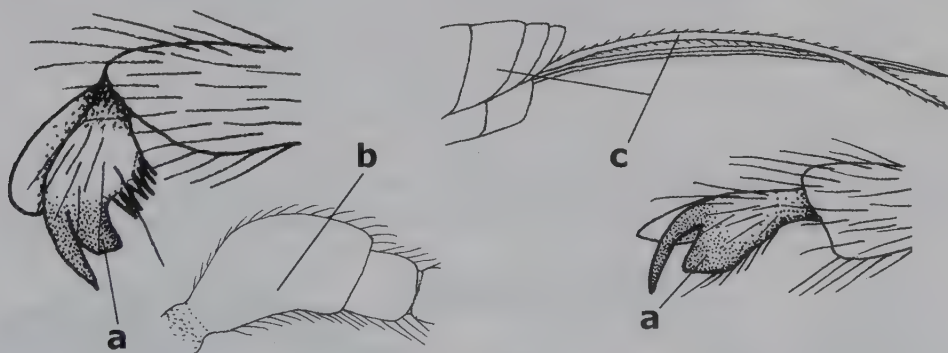
3 Fore spur with a long curved and glabrous apical spine (a); malar space rugulose (b); notauli comparatively wide (c); hind coxa with longitudinal carina or rugae (d); frons with lateral crests or carinae more or less developed (e) *Coccygidium* de Saussure, 1892



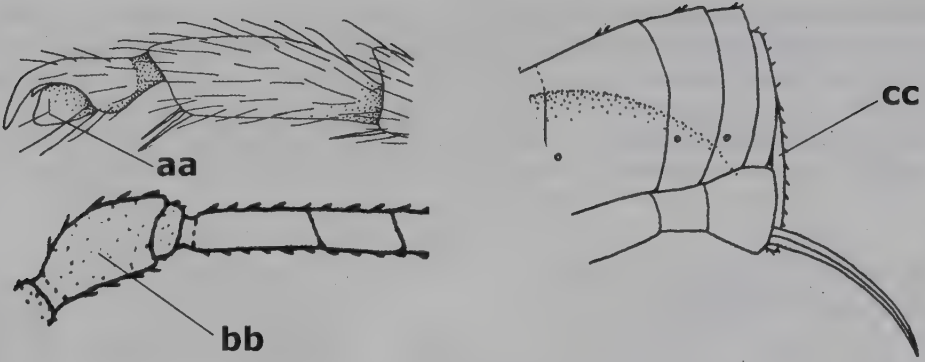
- Fore spur with a short, straight and setose apical spine (aa); malar space smooth or punctate (bb); notauli comparatively narrow (cc); hind coxa without longitudinal carina or rugae (dd); frons without lateral crests or carinae (ee); [area between antennal sockets without a pair of carinae; temples medium-sized; ventral surface of the hind femur densely sculptured; rare in the Afrotropical region and North Africa; not yet found but likely to occur in the Arabian Peninsula] *Zelodia* van Achterberg, 2010



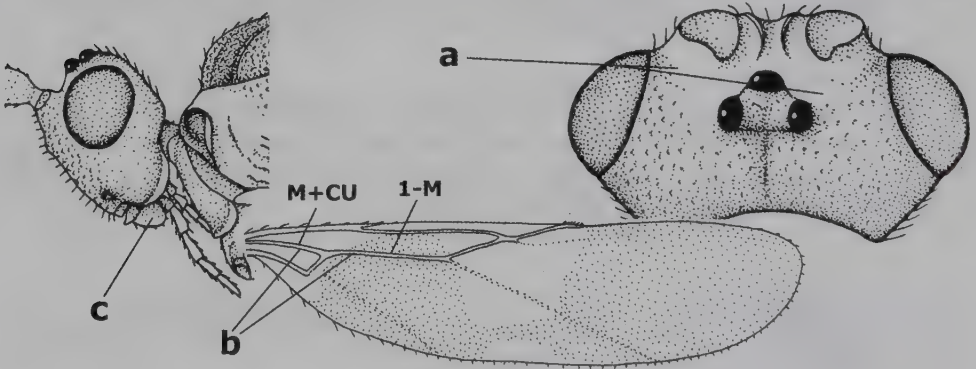
- 4 Outer hind tarsal claw with a dentiform or squarish black lamella and more or less with a black pecten basally and different from inner claw (a); outer aspect of scapus partly smooth and somewhat concave (b); ovipositor sheath slender and moderately long (c); [frons without pair of lamellae between antennal sockets] *Cremonops* Foerster, 1862



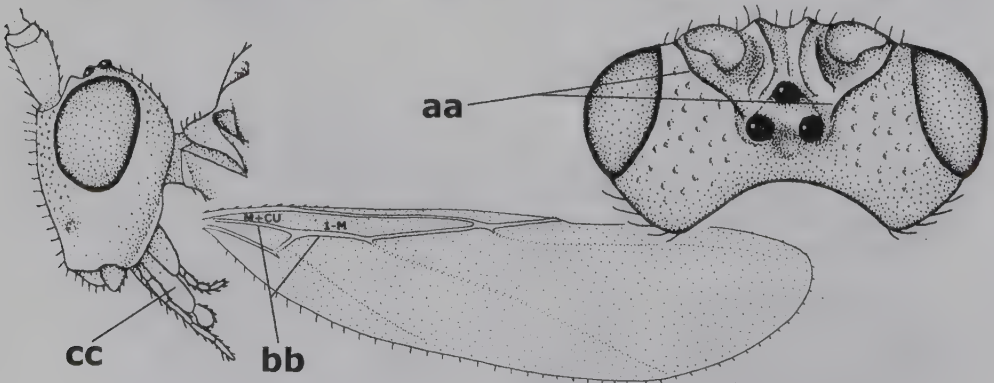
- Inner and outer hind claw bifurcate, with a small subapical inner tooth or (nearly) simple (aa); outer aspect of scapus punctate or punctulate and usually less concave (bb); ovipositor sheath more or less widened and short, about as long as apical height of metasoma or less (cc) 5



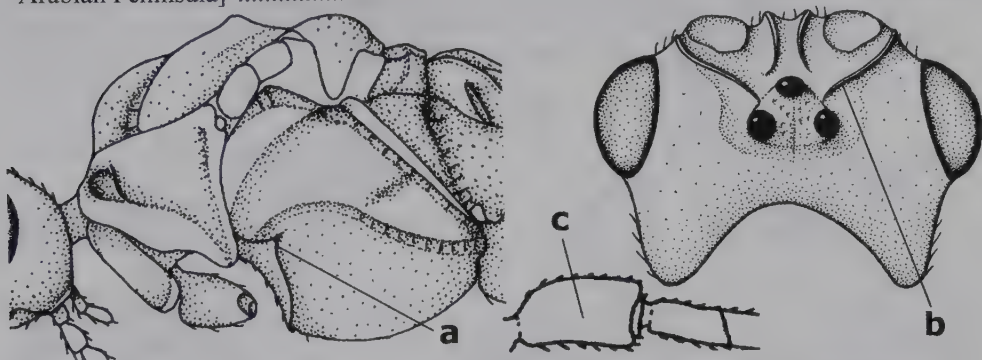
- 5 Frons without lateral carinae (a); vein M+CU of hind wing at most 0.8 times vein 1-M (b); labio-maxillary complex slightly protruding (c); [not yet found in the Arabian Peninsula but likely to occur] *Euagathis* Szépligeti, 1900



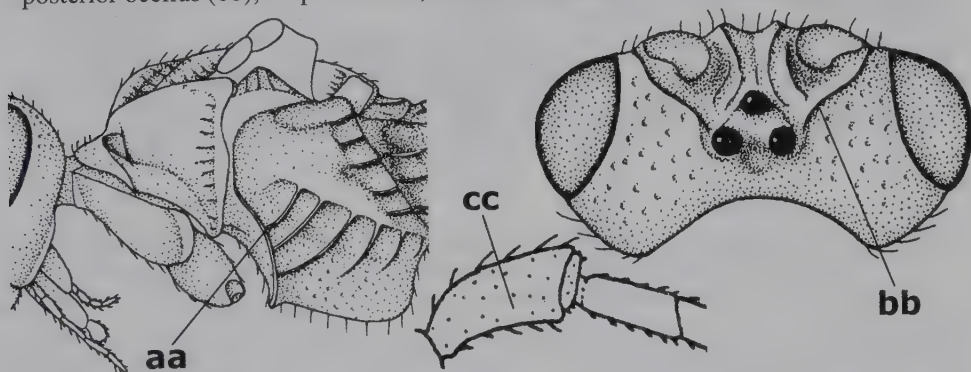
- Frons with lateral carinae (aa); vein M+CU of hind wing longer than vein 1-M or subequal (bb), rarely 0.8 times; labio-maxillary complex usually rather protruding (cc) .. 6



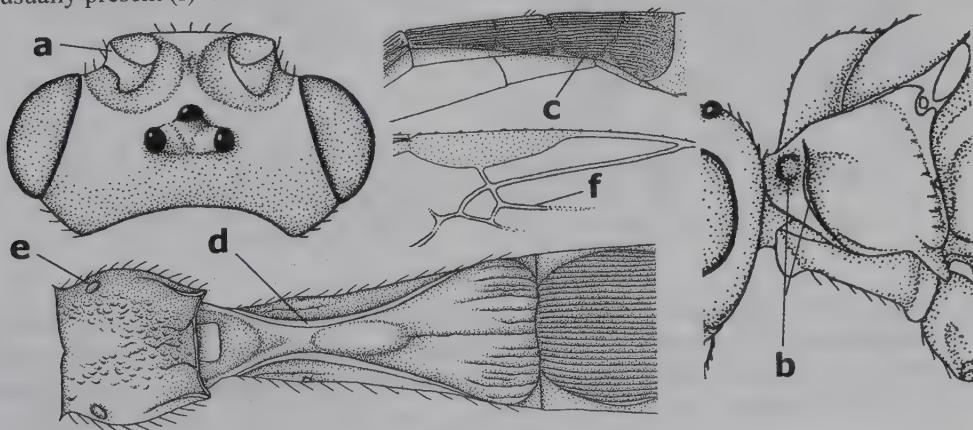
- 6 Prepectal carina distinctly angulate subdorsally (a); lateral carina of frons pointing to anterior ocellus or between anterior and posterior ocellus (b); scapus robust, straight (c); [hind trochantellus rounded ventrally; known from Egypt, but not yet known from the Arabian Peninsula] *Troticus* Brullé, 1846



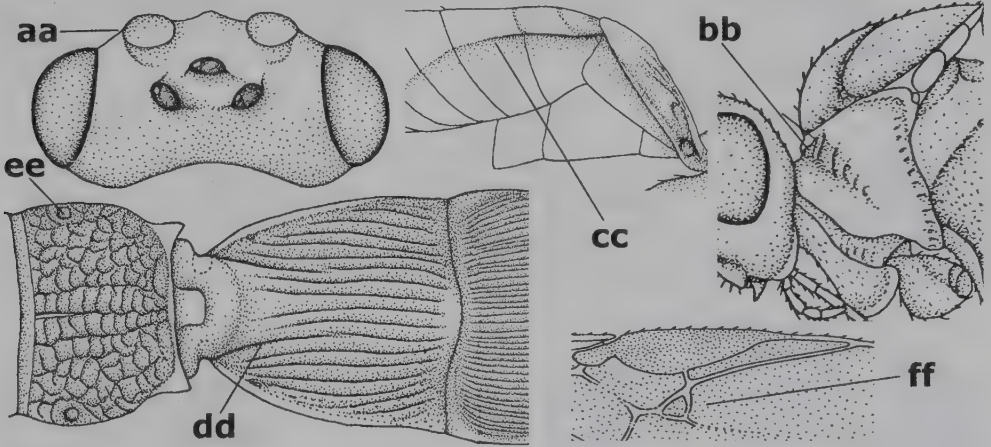
- Prepectal carina evenly curved subdorsally (aa); lateral carina of frons pointing to posterior ocellus (bb); scapus normal, more or less bent (cc) *Disophrys* Foerster, 1862



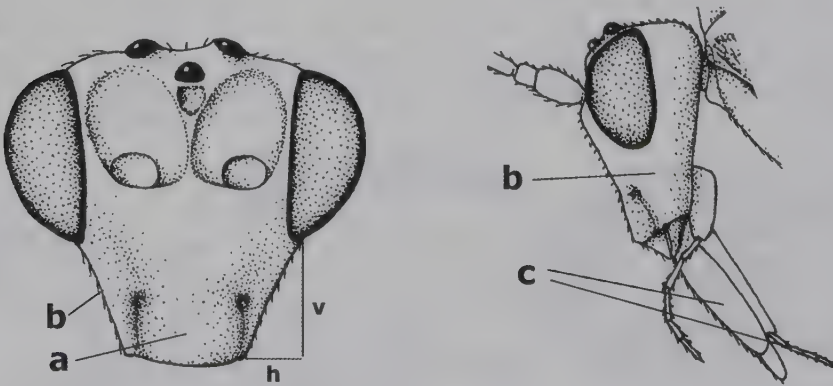
- 7 Outer side of antennal sockets distinctly lamelliform protruding in dorsal view (a); subpronope deep, wide and epomia strongly developed (b); basal half of third metasomal tergite usually with sharp lateral margin (c); dorsal carinae of first tergite usually long and costate (d); propodeal spiracle comparatively large and elliptical (e); ramellus of fore wing usually present (f) *Braunsia* Kriechbaumer, 1894



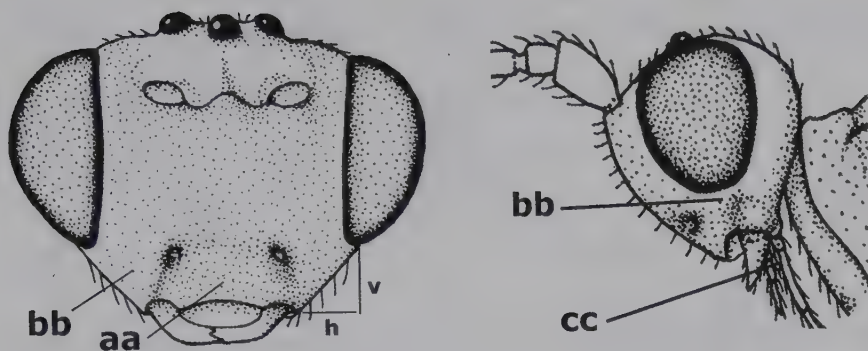
- Outer side of antennal sockets not or only slightly protruding in dorsal view (aa), sometimes as a narrow lamella; subpronope comparatively shallow and epomia medium-sized to weakly developed (bb); basal half of third tergite often without sharp lateral margin or weakly developed (cc), except in *Lytopylus*; dorsal carinae of first tergite usually weakly developed (dd) or absent; propodeal spiracle medium-sized to small, round and sub-elliptical (ee); ramellus of fore wing absent (ff) 8



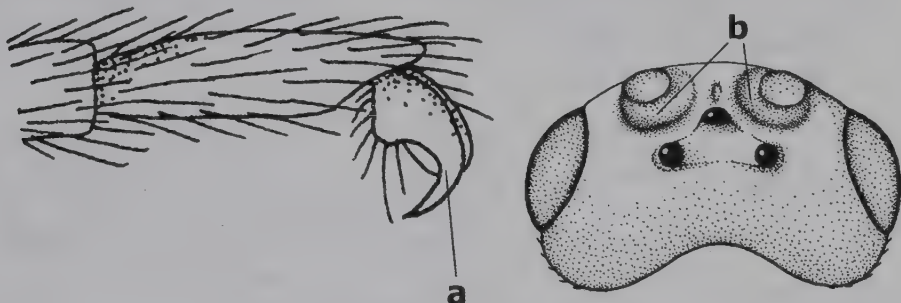
8. Clypeus strongly convex medio-ventrally (a); vertical axis [v] of malar triangle 1.7–6.0 times its horizontal axis [h] and part of head below eyes only gradually narrowed ventrally (b) to parallel-sided (but 1.4–1.6 times in *A. mediator* group); mouth-parts more or less lengthened in form of a beak, galea nearly always distinctly longer than 1.3 times its width longer than labial palp (c) *Agathis* Latreille, 1804



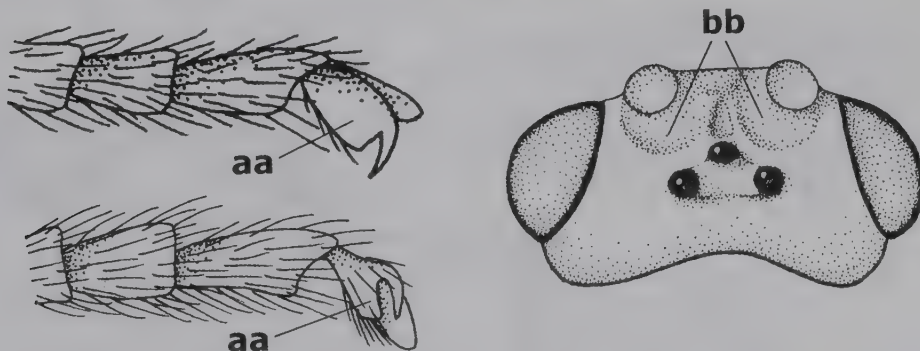
- Clypeus flattened medio-ventrally (aa); vertical axis [v] of malar triangle 1.0–1.5 times its horizontal axis [h] and part of head below eyes directly narrowed ventrally (bb); mouth-parts normal, galea not longer than wide, shorter than labial palp and usually hardly or not visible in lateral view (cc) 9



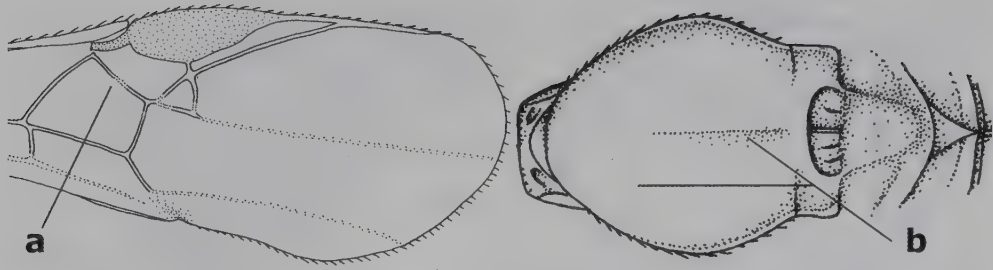
- 9 Fore and middle tarsal claws simple and comparatively robust (a); area behind antennal sockets deeply impressed (b); [vein 1-M of hind wing 1.1–1.6 times as long as vein M+CU; not yet found in the Arabian Peninsula but likely to occur] *Bassus* Fabricius, 1804 s.s.



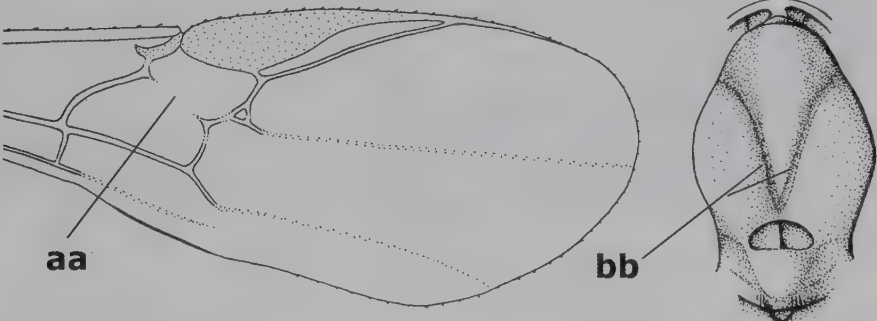
- Fore and middle tarsal claws nearly always with a distinct basal lobe and comparatively slender (aa); area behind antennal sockets nearly always moderately to shallowly impressed (bb); [vein 1-M of hind wing 0.6–1.4 times as long as vein M+CU] 10



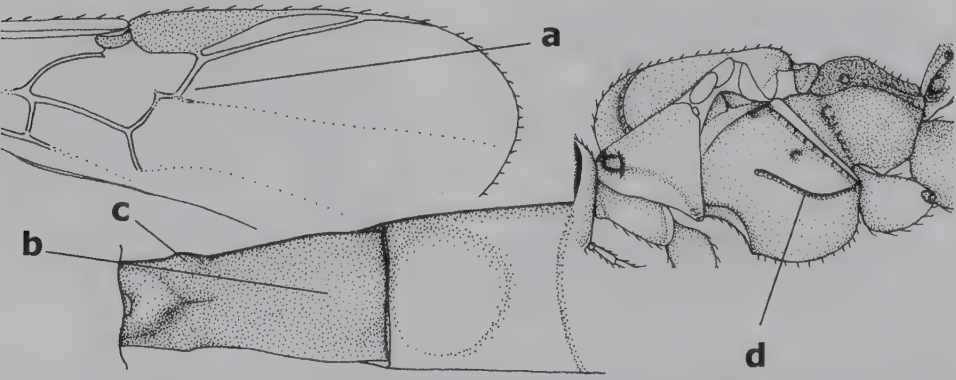
- 10 Vein 1-SR+M of fore wing more or less developed (a), usually sclerotised medially, but sometimes only as a brownish pigmented stripe and notauli absent (but medio-posteriorly with a deep to superficial depression; b); [not yet found in the Arabian Peninsula but likely to occur] *Earinus* Wesmael, 1837



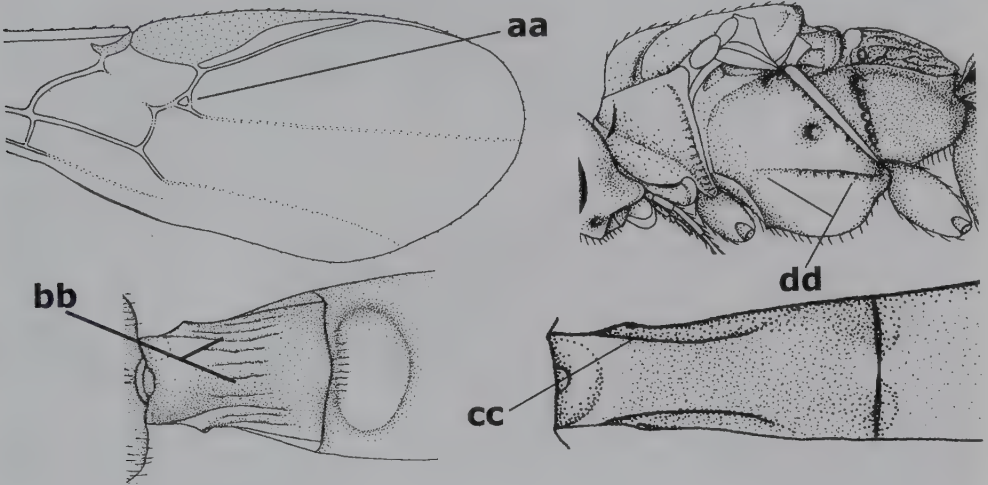
– Vein 1-SR+M of fore wing medially absent, not sclerotised and usually without pigmentation (aa), if pigmented then notauli complete (bb) 11



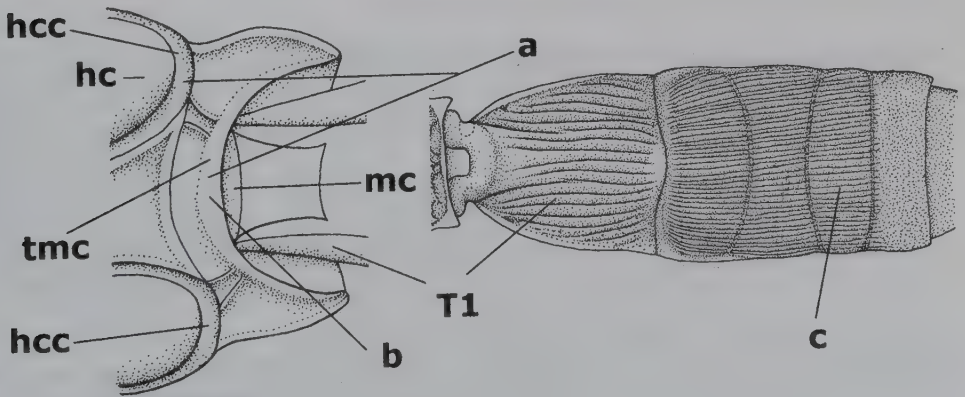
11 Vein r-m of fore wing absent (a); first metasomal tergite and often also metapleuron granulate (b) and dull and tergite distinctly convex medially and dorsal carinae absent (c); precoxal sulcus curved posteriorly (d) *Camptothlipsis* Enderlein, 1920



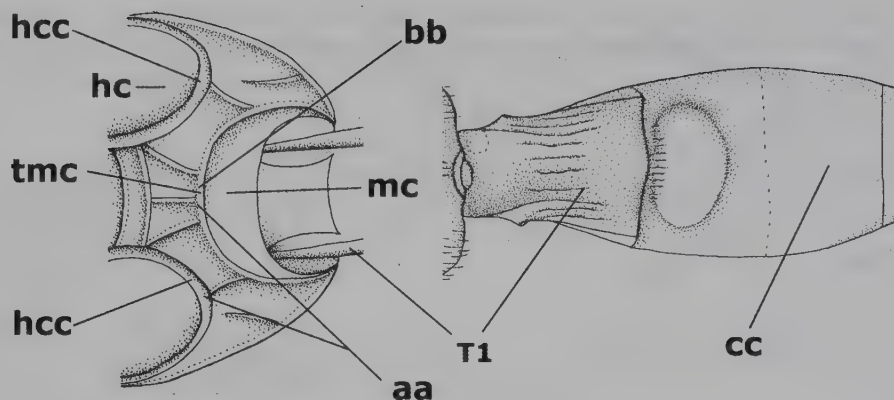
- Vein r-m of fore wing present (aa), rarely obsolescent or absent; if absent then first tergite rugose or striate (bb) or with dorsal carinae (cc) and precoxal sulcus straight posteriorly (dd) 12



- 12 Metasomal cavity [mc] at most reaching upper level of hind coxal cavities [hcc] (a); transverse metasternal carina [tmc] (= carina behind metasomal cavity) straight or nearly so and coarsely developed (b); anterior half of third metasomal tergite often more or less coarsely striate (c), but sometimes smooth; [scutellar sulcus smooth] *Lytopylus* Foerster, 1862



- Metasomal cavity [mc] protruding beyond upper level of hind coxal cavities [hcc] (aa); transverse metasternal carina [tmc] curved and less developed (bb); sculpture of anterior half of third tergite variable, usually smooth or finely striate (cc) *Therophilus* Wesmael, 1837



Genus *Agathis* Latreille, 1804

Plates 1–18

Baeognatha Kokujev, 1903: 243; Shenefelt, 1970: 367. Type species (by monotypy): *Baeognatha turanica* Kokujev, 1903. **Nov. syn.**

Note: The genus *Baeognatha* Kokujev, 1903, has been treated either as a synonym of *Camptothlipsis* Enderlein, 1920 (Nixon, 1986), or as a separate genus near *Bassus* Fabricius, 1804 (Simbolotti & van Achterberg, 1992; because of the aberrant tarsal claws), or as synonym of *Therophilus* Wesmael, 1837 (Sharkey et al., 2009). The variation of the *Agathis* spp. with simple tarsal claws from the Arabian Peninsula indicate that *Baeognatha* falls within the variation of the genus *Agathis* Latreille. The *Agathis mediator* group as defined in Simbolotti & van Achterberg (1992), and often largely included in *Bassus*, should be also included in *Agathis* because of the convex clypeus and the lack of a well-developed tarsal lobe. They form a natural group having the tarsal claws simple, the head somewhat enlarged with a convex clypeus and the mouthparts hardly or not modified.

Key to Arab species of the genus *Agathis* Latreille

- 1 Tegulae pale yellow; head less elongate in anterior view (Plate 7); antenna of female with 20–22 segments; first metasomal tergite largely rugulose (Plate 4); mesoscutum moderately shiny; ovipositor sheath 0.9–1.0 times as long as fore wing; UAE *A. luteotegula* nov. spec.
- Tegulae blackish or largely dark brown; head more elongate in anterior view (Plate 16); antenna of female with 17–18 segments; first tergite largely smooth (Plate 13); mesoscutum strongly shiny; ovipositor sheath 0.6–0.7 times as long as fore wing; UAE *A. melanotegula* nov. spec.

Agathis luteotegula van Achterberg **nov. spec.**

Plates 1–9

Specimens examined: Holotype: ♀ (RMNH), “United Arab Emirates, Sharjah Desert Park (1394), 25°17'N, 55°42'E, 13–23.iv.2005, light tr[ap], A. v. Harten, RMNH'05”. Paratypes (3♂+8♀): 1♀, idem; 1♀, idem but 29.iii–6.iv.2005; 2♂, 1♀, idem but 6–13.iv.2005; 1♀, idem but 23–30.iv.2005. 1♂, 4♀, al-Ajban, 24°36'N, 55°01'E, 27.v–26.vi.2006, MT, AvH.

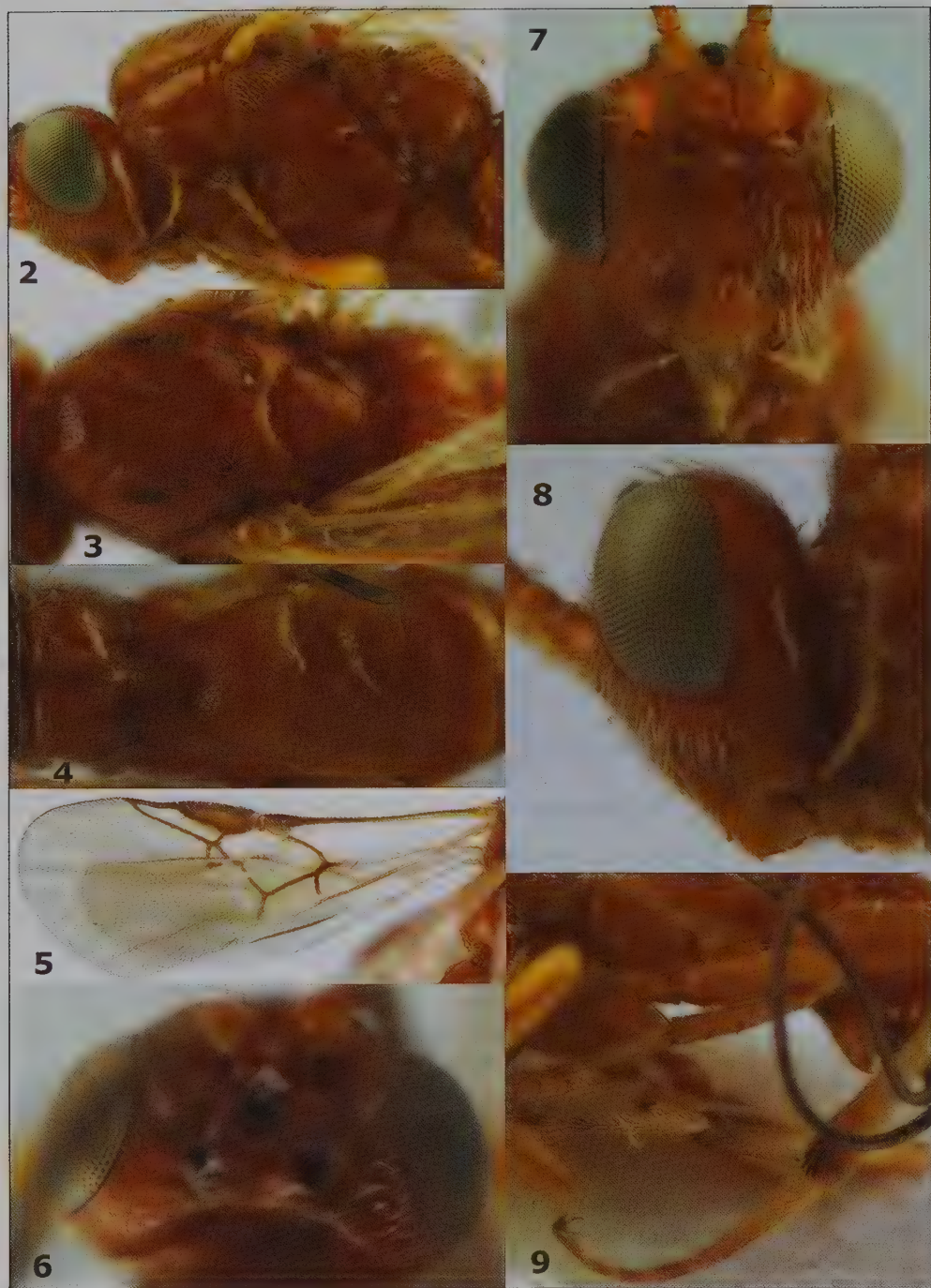
Diagnosis: The new species has the tegulae pale yellow, the head less elongate in anterior view than of *A. melanotegula*, the antenna of female with 20–22 segments and the first metasomal tergite largely rugulose and the mesoscutum moderately shiny. It is similar to the



Plate 1. *Agathis luteotegula* van Achterberg nov. spec., female, holotype, UAE (Sharjah Desert Park), habitus, lateral aspect.

Central Asian *A. zaisanica* Tobias, 1963, but it differs by having the vein 2-R1 of the fore wing absent (present in *A. zaisanica*) and the height of the eye about 2.1 times length of malar space (about 1.6 times).

Description: Female, holotype, length of fore wing 2.8 mm and of body 3.8 mm. Head. Antennal segments 22 (but most with an indistinct division halfway), third segment mat, length of third segment 1.6 times fourth segment, length of third, fourth and penultimate segments 3.7, 2.3 and 2.7 times their width, respectively; apical antennal segment 1.4 times as long as penultimate segment; length of maxillary palp 0.5 times height of head; in dorsal view eye 3.1 times as long as temple (Plate 6); POL:OD:OOL = 13:5: 7; between antennal sockets with triangular area; occipital flange narrow; face evenly convex and punctulate; clypeus strongly convex, nose-like and smooth; frons smooth, depression above antennal socket up to posterior ocellus, no distinctly median lamella or carina and area in front of anterior ocellus flat or nearly so; vertex convex and sparsely punctulate; length of malar space 2.8 times as long as basal width of mandible and eye 2.1 times as high as malar space; galea 0.7 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.5 times its height; side of pronotum smooth medially, rugose anteriorly, sparsely finely punctate dorsally and crenulate posteriorly; area near lateral carina of mesoscutum with micro-crenulae;



Plates 2–9. *Agathis luteotegula* van Achterberg nov. spec., female, holotype, UAE (Sharjah Desert Park). 2: Mesosoma, lateral aspect; 3: Mesosoma, dorsal aspect; 4: Propodeum and first–third metasomal tergites, dorsal aspect; 5: Wings; 6: Head, dorsal aspect; 7: Head, anterior aspect; 8: Head, lateral aspect; 9: Middle and hind legs, lateral aspect.

mesoscutum sparsely punctulate, moderately shiny and weakly convex; notauli complete, shallow and finely crenulate (Plate 3); scutellar sulcus 0.2 times as long as dorsal face of scutellum, narrow laterally and with 7 short carinae; scutellum sparsely punctulate and slightly convex; precoxal sulcus narrow, finely crenulate and anterior third absent (Plate 2); mesopleuron sparsely punctulate; metapleuron with rather dense setosity and punctulate and rugose ventrally; propodeum rugose-punctate basally and with elongate reversed V-shaped rugose area, enclosing an elongate shiny and smooth area, remainder of propodeum largely smooth and shiny, spiracle small and round, removed from medium-sized nearly complete lateral carina. Wings. Fore wing: 2-R1 absent; 1-R1 half as long as pterostigma; pterostigma semi-circular; second submarginal cell quadrangular, narrow anteriorly (Plate 5); $r:3\text{-SR:SR1} = 5:2:37$; $2\text{-SR}:3\text{-SR:r-m} = 8:2:8$; vein cu-apostfurcal; surroundings of 1-M rather densely setose. Hind wing: with 3 hamuli; vein M+CU 1.5 times as long as vein 1-M; surroundings of cu-arather densely setose. Legs. Length of hind femur, tibia and basitarsus 3.0, 6.4 and 8.0 times their width, respectively; hind femur and tibia smooth and shiny; outer side of middle and hind tibiae with 2 and 1 pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.4 times middle basitarsus; length of outer and inner spurs of hind tibia 0.4 and 0.5 times hind basitarsus, respectively; fore femur and tarsus slender; tarsal claws simple and slender. Metasoma. First tergite strongly widened apically and 0.9 times as long as its apical width (Plate 4), largely densely and finely rugose, but mainly smooth apically, dorsal carinae weakly developed in basal third of tergite; second tergite smooth, with convex elliptical basal area surrounded by a deep depression; second tergite 1.1 times as long as third tergite; second metasomal suture narrow but distinct; metasoma nearly completely glabrous; ovipositor sheath slender (but slightly widened apically) and with short setae; ovipositor sheath 0.95 times as long as fore wing and 3.8 times as long as hind tibia.

Colour. Yellowish-brown; antenna (except three yellowish basal segments) and ovipositor sheath dark brown; hind tarsus largely and apex of hind tibia brownish, remainder of tibia and of tarsus, and spurs, middle tibia, tegulae and palpi pale yellowish; remainder of legs brownish-yellow; wings hyaline; pterostigma, most of veins and parastigma brown.

Variation. Three quarter of type series is melanistic having head, first-third antennal segments, mesosoma, first tergite, hind coxa and femur to a variable degree dark chestnut brown or black, but tegulae pale yellowish. Length of fore wing 2.1–2.8 mm, and of body 2.2–3.8 mm; antennal segments of female 20 (1), 21 (6), 22 (2), of male 20 (1), 21 (1), 22 (1); ovipositor sheath 0.87–0.98 times as long as fore wing; propodeum smooth to rugose anteriorly.

Biology: Unknown.

Distribution: United Arab Emirates.

Etymology: The name "*luteotegula*" refers to the yellowish ("luteus" in Latin) tegulae ("tegula" is Latin for roofing-tile).

Agathis melanotegula* van Achterberg *nov. spec.

Plates 10–18

Specimens examined: Holotype: ♀ (RMNH), "United Arab Emirates, NARC near Sweihan, 24°24'N, 55°26'E, 1.ii.–14.iii.2005 (1410), light trap, A. v. Harten, RMNH'05". Paratypes (1♂+1♀): idem, 2–9.iv.2005. 1♂, 1♀, al-Ajban, 24°36'N, 55°01'E, 1.iv.–2.v.2006, MT, AvH.

Diagnosis: The new species has the tegulae blackish or largely dark brown, the head more elongate in anterior view than *A. luteotegula*, the antenna of female with 17–18 segments, the first tergite largely smooth and the mesoscutum strongly shiny. It is similar to the West and Central Palaearctic *A. mediator* (Nees, 1812), but the new species has only 17–18 antennal segments (26–31 in *A. mediator*), ovipositor sheath 0.6–0.7 times fore wing (0.4–0.5 times),



Plate 10. *Agathis melanotegula* van Achterberg nov. spec., female, holotype, UAE (NARC), habitus, lateral aspect.

vein 2-R1 of the fore wing absent (present) and the second metasomal tergite smooth (granulate or rugulose). The Central Asian *A. turanica* (Kokujev, 1903) [**nov. comb.**] has similar slender tarsal claws, but the new species differs by having the second submarginal cell of the fore wing quadrangular (petiolate triangular in *A. turanica*), the head less narrowed ventrally (more narrowed), the precoxal sulcus finely crenulate (smooth), the second metasomal tergite with oblique crenulate groove (absent) and the antenna with 16–18 segments (about 32 segments).

Description: Female, holotype, length of fore wing 2.2 mm and of body 2.7 mm. Head. Antennal segments 18 (without indistinct divisions halfway), third segment shiny, length of third segment 1.7 times fourth segment, length of third, fourth and penultimate segments 5.0, 3.0 and 1.7 times their width, respectively; apical antennal segment as long as penultimate segment; length of maxillary palp 0.4 times height of head; in dorsal view eye 3.6 times as long as temple (Plate 18); POL:OD:OOL = 10:5: 7; between antennal sockets with triangular area; occipital flange absent; face evenly convex and punctulate; clypeus strongly convex, nose-like and smooth; frons smooth, depression above antennal socket nearly up to posterior ocellus, no distinctly median lamella or carina and area in front of anterior ocellus smooth slightly triangularly impressed; vertex convex and sparsely punctulate; length of malar space



Plates 11–18. *Agathis melanotegula* van Achterberg nov. spec., female, holotype, UAE (NARC).
 11: Mesosoma, lateral aspect; 12: Mesosoma, dorsal aspect; 13 First-third metasomal tergites, dorsal aspect; 14: Wings; 15: Hind leg, lateral aspect; 16: Head, anterior aspect; 17: Head, lateral aspect; 18: Head, dorsal aspect.

3.2 times as long as basal width of mandible and eye 1.7 times as high as malar space; galea 0.7 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.3 times its height; side of pronotum smooth medially, rugulose antero-ventrally, sparsely finely punctate dorsally and crenulate posteriorly and medio-anteriorly; area near lateral carina of mesoscutum with micro-crenulae; mesoscutum sparsely punctulate, moderately shiny and weakly convex; notauli complete, rather deep and finely crenulate (Plate 12); scutellar sulcus 0.2 times as long as dorsal face of scutellum, narrow laterally and with 7 short carinae; scutellum sparsely punctulate and moderately convex; precoxal sulcus narrow, finely crenulate and anterior third absent (Plate 11); mesopleuron strongly shiny and nearly entirely smooth; metapleuron with rather dense setosity and punctulate and rugose ventrally; propodeum narrowly smooth basally, coarsely punctate subbasally and with elongate reversed V-shaped punctate area, enclosing an elongate shiny and smooth area, remainder of propodeum largely smooth and shiny, spiracle small and round, area without lateral carina and coarsely rugose. Wings. Fore wing: 2-R1 absent; 1-R1 0.4 times as long as pterostigma; pterostigma semi-circular; second submarginal cell quadrangular, narrow anteriorly (Plate 14); $r:3\text{-}SR:SR1 = 2:1:26$; $2\text{-}SR:3\text{-}SR:r\text{-}m = 6:1:5$; vein cu-a postfurcal; surroundings of 1-M sparsely setose. Hind wing: with 3 hamuli; vein M+CU as long as vein 1-M; surroundings of cu-a sparsely setose. Legs. Length of hind femur, tibia and basitarsus 2.8, 5.6 and 8.0 times their width, respectively; hind femur and tibia smooth and shiny; outer side of middle and hind tibiae with 2 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.5 times middle basitarsus; length of outer and inner spurs of hind tibia 0.4 times hind basitarsus; fore femur moderately wide and tarsus slender; tarsal claws simple and slender. Metasoma. First tergite strongly widened apically and 0.8 times as long as its apical width (Plate 13), largely smooth, with some punctulation, dorsal carinae absent; second tergite smooth except for a pair of oblique crenulate grooves behind basal area, with convex triangular basal area surrounded by an oblique anterior depression; second tergite as long as third tergite and strongly transverse; second metasomal suture narrow but distinct; metasoma nearly completely glabrous; ovipositor sheath slender (but slightly widened apically) and with short setae; ovipositor sheath 0.57 times as long as fore wing and 1.7 times as long as hind tibia. Colour. Black; antenna, palpi, humeral plate, femora (except yellowish apex), apical third of hind tibia, third–fifth tarsal segments, metasoma ventrally and posteriorly, pterostigma largely and ovipositor sheath dark brown; middle tibia brownish (except yellowish base); remainder of tibiae and tarsi pale yellowish, but hind tibia with faint brownish subbasal patch; wings hyaline; most of veins and parastigma brown.

Variation. Length of fore wing 2.0–2.2 mm, and of body 2.6–2.7 mm; antennal segments of female 17 (1), 18 (1), of male 16 (1); ovipositor sheath 0.57–0.68 times as long as fore wing; first tergite with row of elongate punctures or nearly smooth; first tergite laterally, second most of third tergite brown or black; propodeum with narrow areola medially more or less developed; dark subbasal patch of hind tibia absent or present; tarsi largely yellowish or apical half infusate.

Biology: Unknown, but *A. mediator* (Nees) is a parasitoid of Coleophoridae.

Distribution: United Arab Emirates.

Etymology: The name “*melanotegula*” refers to the blackish (“melanos” in Greek) tegulae (“tegula” is Latin for roofing-tile).

Genus *Braunsia* Kriechbaumer, 1894

Plates 19–27

Note: Only one male from Yemen has been found (al-Lahima, 16.x–31.xii.2000, Malaise trap). It belongs to an undescribed species with the 6th–8th metasomal tergites and the genitalia ivory and no ramellus connected to the second submarginal cell of the fore wing.



Plate 19. *Braunsia* nov. spec., male, Yemen (Al Lahima), habitus, lateral aspect.

Genus *Camptothlipsis* Enderlein, 1920

Plates 28–55

Key to Arab species of the genus *Camptothlipsis* Enderlein

- 1 Hind femur slender and dark brown (Plate 33); antenna of female with about 21 segments and about 0.6 times as long as body; marginal cell of fore wing narrowed medially (Plate 32); length of body about 3 mm; Yemen *C. brevantennalis* nov. spec.
- Hind femur robust and brownish-yellow (Plates 43, 52); antenna of female with 28–31 segments and 0.7–0.9 times as long as body; marginal cell of fore wing parallel-sided medially (Plates 42, 51); length of body 4–5 mm 2
- 2 Pterostigma pale or yellowish-brown (Plate 51); penultimate antennal segments of female slightly longer than wide; basal half of fore wing with sparse setae, much less than on apical half; ovipositor sheath about 1.2 times as long as metasoma and 0.8–0.9 times as long as fore wing; second metasomal tergite smooth or largely so (Plate 50); marginal cell of fore wing parallel-sided anteriorly (Plate 51); head less robust in anterior view (Plate 53); Yemen *C. luteostigmalis* nov. spec.
- Pterostigma dark brown (Plate 42); penultimate antennal segments of female distinctly longer than wide; basal half of fore wing with dense setae, similar to apical half of wing; ovipositor sheath about 1.4 times as long as metasoma and 0.9–1.0 times as long as fore wing; second tergite largely granulate (Plate 41); marginal cell of fore wing widened anteriorly (Plate 42); head rather robust in anterior view (Plate 44); Yemen *C. fuscistigmalis* nov. spec.



Plates 20–27. *Braunsia* nov. spec., male, Yemen (al-Lahima). 20: Mesosoma, lateral aspect; 21: Mesosoma, dorsal aspect; 22: First-third metasomal tergites, dorsal aspect; 23: Wings; 24: Hind leg, lateral aspect; 25: Head, anterior aspect; 26: Head, lateral aspect; 27: Head, dorsal aspect.

Camptothlipsis brevantennalis van Achterberg nov. spec.

Plates 28–37

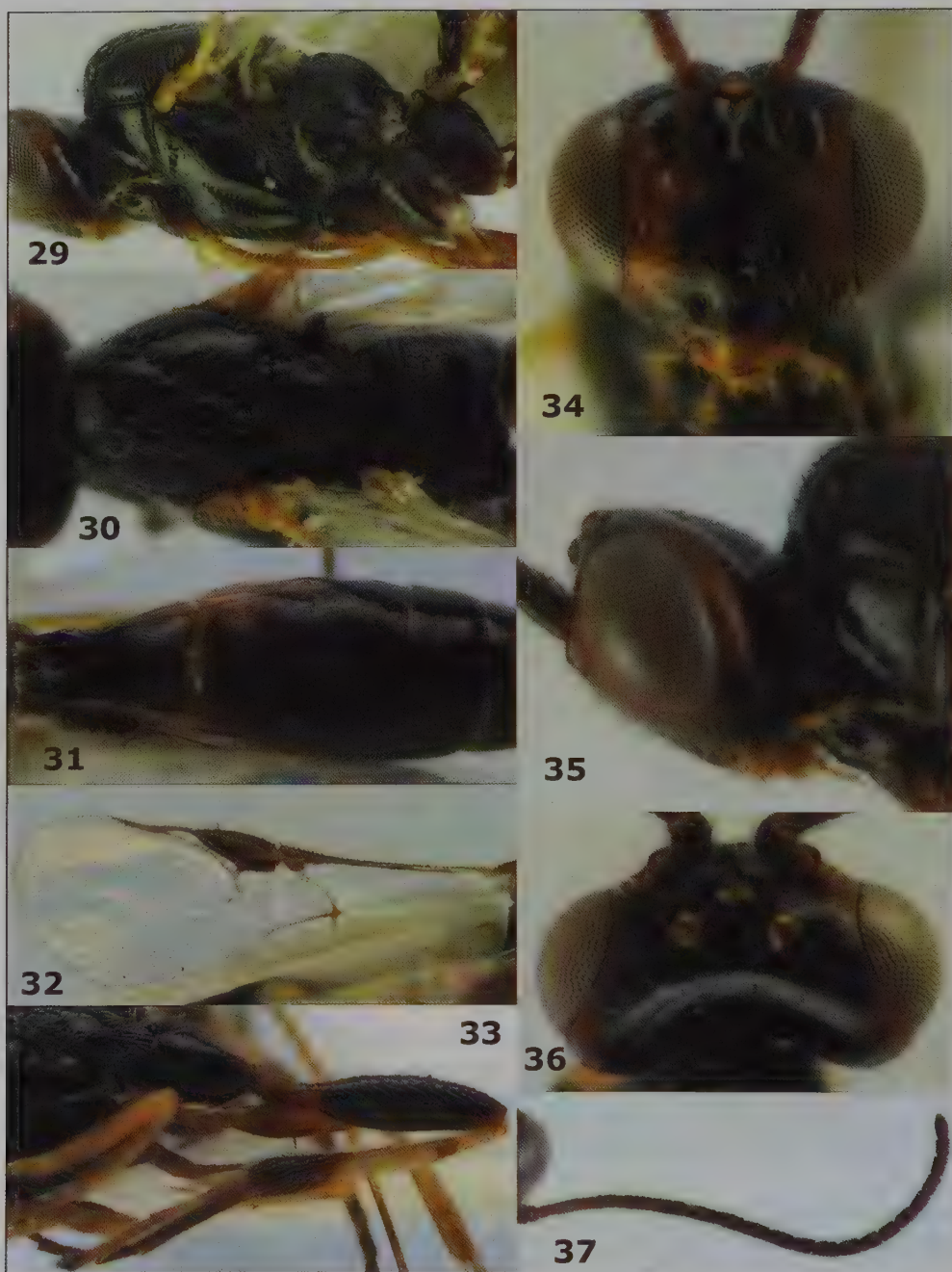
Specimen examined: Holotype: ♀ (RMNH), “Yemen (6151), Al Kowd, 1–5.ix.2001, light trap, A. v. Harten [&] S. Al Haruri, RMNH’02”.



Plate 28. *Camptothlipsis breviantennalis* van Achterberg nov. spec., female, holotype, Yemen (al-Kowd), habitus, lateral aspect.

Diagnosis: The new species has the hind femur slender and blackish, the body largely black, the antenna of female with about 21 segments and about 0.6 times as long as the body, the marginal cell of the fore wing narrowed medially and the length of body about 3 mm. It is similar to *C. curticornis* Granger, 1949, from Madagascar, but the new species has about 21 antennal segments (28–30 in *C. curticornis*), the pronotum black (yellowish-brown), the hind femur dark brown (yellowish-brown) and the hind tibia with minute subbasal dark spot (with dark band).

Description: Female, holotype, length of fore wing 2.0 mm and of body 3.0 mm. Head. Antennal segments 21 (without indistinct divisions halfway and 0.6 times as long as body), third segment mat, length of third segment 1.4 times fourth segment, length of third, fourth and penultimate segments 3.7, 2.7 and 1.3 times their width, respectively; apical antennal segment 1.5 times as long as penultimate segment; length of maxillary palp 0.5 times height of head; in dorsal view eye 3.4 times as long as temple (Plate 36); POL:OD:OOL = 7:4:6; between antennal sockets with weak triangular area; occipital flange narrow; face evenly



Plates 29–37. *Camptothlipsis breviantennalis* van Achterberg nov. spec., female, holotype, Yemen (al-Kowd). 29: Mesosoma, lateral aspect; 30: Mesosoma, dorsal aspect; 31: First–third metasomal tergites, dorsal aspect; 32: Fore wing; 33: Hind leg, lateral aspect; 34: Head, anterior aspect; 35: Head, lateral aspect; 36: Head, dorsal aspect; 37: Antenna.

convex and smooth; clypeus flattened medio-ventrally and smooth; frons smooth, area above antennal socket slightly depressed, no distinctly median lamella or carina and area in front of anterior ocellus narrow triangularly impressed; vertex convex and smooth; length of malar space twice as long as basal width of mandible and eye 2.3 times as high as malar space; galea 0.4 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.5 times its height; side of pronotum smooth, but crenulate posteriorly and medio-anteriorly; area near lateral carina of mesoscutum with micro-crenulae; mesoscutum strongly shiny and sparsely punctulate, moderately convex; notauli complete, rather deep and finely crenulate (Plate 30); scutellar sulcus 0.5 times as long as dorsal face of scutellum and only narrowly crenulate; scutellum sparsely punctulate and rather flat; precoxal sulcus narrow, finely crenulate and anterior quarter absent (Plate 29); epicnemial area with some punctures, mesopleuron strongly shiny and nearly entirely smooth; mesosternal suture distinctly crenulate; metapleuron with rather dense setosity and punctulate and rugose ventrally; propodeum densely punctate basally, superficially granulate medially and remainder shiny and largely smooth, spiracle small and round, lateral carina weakly developed. Wings. Fore wing: 2-R1 1.2 times as long as 1-R1; 1-R1 0.35 times as long as pterostigma; pterostigma semi-oval; marginal cell narrowed medially (Plate 32); r:SR1:2-SR = 2:31:9; cu-a interstitial; basal half of wing with sparse setae and apical half normally setose. Hind wing: with 3 hamuli; vein M+CU 0.7 times as long as vein 1-M; surroundings of cu-a sparsely setose. Legs. Length of hind femur, tibia and basitarsus 3.6, 8.0 and 9.3 times their width, respectively; hind femur largely smooth and shiny; outer side of middle and hind tibiae with 2 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.6 times middle basitarsus; length of outer and inner spurs of hind tibia 0.25 and 0.30 times middle basitarsus; fore femur and tarsus slender; tarsal claws with minute acute lobe. Metasoma. First tergite moderately widened apically, weakly constricted behind spiracles and 1.4 times as long as its apical width (Plate 31), shiny granulate, dorsal carinae absent; second tergite nearly smooth, superficially granulate, with slightly differentiated wide elliptical basal area and posteriorly with indistinct narrow depression; second tergite 1.1 times as long as third tergite and trapezoid; second metasomal suture narrow but distinct; metasoma nearly completely glabrous; ovipositor sheath slender (but slightly widened apically) and with medium-sized setae; ovipositor sheath 0.87 times as long as fore wing and 2.1 times as long as hind tibia.

Colour. Black; antenna, coxae, hind femur, small subbasal spot of hind tibia and apical 0.4 of hind tibia, hind tarsus, largely metasoma (but ventro-basally yellowish-brown), ovipositor sheath and fore wing anteriorly (including pterostigma) dark brown; remainder of veins largely colourless; basal 0.6 of hind tibia (except small spot) and hind spurs whitish; palpi, labrum, humeral plate and remainder of legs pale yellowish; orbits of eye and clypeus ventrally orange-brown; wings hyaline.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name "*breviantennalis*" refers to the short ("brevis" in Latin) antenna ("antenna" is Latin for sailyard or appendage).

***Camptothlipsis fuscistigmalis* van Achterberg nov. spec.**

Plates 38–46

Specimens examined: Holotype: ♀ (RMNH), "Yemen (6983), 12 km NW Manakhah, Mal[aise] trap, 5.v.–17.vi.2002, A. v. Harten, RMNH'03". Paratype: 1♀, idem, but 17.vi–6.vii.2002.

Diagnosis: The new species has the pterostigma dark brown, the penultimate antennal segments of female distinctly longer than wide, the ovipositor sheath about 1.4 times as long



Plate 38. *Camptothlipsis fuscistigmalis* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah), habitus, lateral aspect.

as the metasoma and 0.9 times as long as the fore wing, the second metasomal tergite largely granulate, the marginal cell of the fore wing widened anteriorly (Plate 42) and the head comparatively robust in anterior view (Plate 44). It is similar to *C. curticornis* Granger, 1949, from Madagascar, but the new species has the basal 0.6 of hind tibia brownish-yellow and without subbasal dark band (ivory and with dark band in *C. curticornis*), the head yellowish-brown (largely blackish), the pterostigma dark brown (brown), the marginal cell moderately narrowed posteriorly (strongly narrowed), the fore wing weakly infusate (subhyaline) and the second metasomal tergite granulate (smooth).

Description: Female, holotype, length of fore wing 3.4 mm and of body 3.3 mm. Head. Antennal segments 30 (without indistinct divisions halfway and 0.7 times as long as body), third segment mat, length of third segment 1.3 times fourth segment, length of third, fourth and penultimate segments 3.8, 3.0 and 1.7 times their width, respectively; apical antennal segment 1.5 times as long as penultimate segment; length of maxillary palp 0.8 times height of head; in dorsal view eye 4.4 times as long as temple (Plate 46); POL:OD:OOL = 9:5:9; between antennal sockets with a triangular area; occipital flange rather narrow; face evenly convex and smooth, with dense setae; clypeus flattened and concave medio-ventrally and



Plates 39–46. *Camptothlipsis fuscistigmalis* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah). 39: Mesosoma, lateral aspect; 40: Mesosoma, dorsal aspect; 41: First–third metasomal tergites, dorsal aspect; 42: Wings; 43: Hind leg, lateral aspect; 44: Head, anterior aspect; 45: Head, lateral aspect; 46: Head, dorsal aspect.

smooth; frons smooth, area above antennal socket distinctly depressed and up to stemmaticum, with short median carina and area in front of anterior ocellus narrow triangularly impressed; vertex convex and smooth except for some fine punctures; length of malar space 3.2 times as long as basal width of mandible and eye 1.7 times as high as malar space; galea 0.6 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.5 times its height; side of pronotum smooth, but crenulate posteriorly and medio-anteriorly and punctate medio-ventrally; area near lateral carina of mesoscutum nearly smooth; mesoscutum with satin sheen and sparsely punctulate, moderately convex; notauli complete, rather shallow and finely crenulate (Plate 40); scutellar sulcus 0.2 times as long as dorsal face of scutellum and with 5 short crenulae; scutellum sparsely punctulate and rather convex; precoxal sulcus narrow, finely crenulate and anterior quarter absent (Plate 39); epicnemial area with some punctures, mesopleuron strongly shiny and nearly entirely smooth; mesosternal suture very finely crenulate, nearly smooth; metapleuron with rather dense setosity and punctulate and rugose ventrally; propodeum densely granulate-rugulose and rather mat, spiracle small and round, lateral carina indistinctly developed. Wings. Fore wing: 2-R1 1.3 times as long as 1-R1; 1-R1 0.5 times as long as pterostigma; pterostigma semi-oval; posterior half of marginal cell parallel-sided and moderately narrow (Plate 42); r:SR1:2-SR = 3:40:9; cu-a interstitial; entire wing with dense setae. Hind wing: with 4 hamuli; vein M+CU 0.8 times as long as vein 1-M; surroundings of cu-a setose. Legs. Length of hind femur, tibia and basitarsus 3.1, 6.5 and 9.0 times their width, respectively; hind femur largely smooth (except for minute setiferous elevations) and shiny; outer side of middle and hind tibiae with 4 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.5 and 0.7 times middle basitarsus; length of outer and inner spurs of hind tibia 0.35 and 0.40 times hind basitarsus; fore femur and tarsus slender; tarsal claws with medium-sized acute lobe. Metasoma. First tergite moderately widened apically, weakly constricted behind spiracles and 1.6 times as long as its apical width (Plate 41), weakly shiny and distinctly granulate, dorsal carinae absent; second tergite distinctly granulate, with slightly differentiated wide elliptical basal area and posteriorly with obsolescent depression; second tergite 1.2 times as long as third tergite and trapezoid; second metasomal suture obsolescent; metasoma largely glabrous, only with apical row of setae; ovipositor sheath slender (but slightly widened apically) and with medium-sized setae; ovipositor sheath 0.99 times as long as fore wing and 2.4 times as long as hind tibia.

Colour. Yellowish-brown; antenna (but scapus largely yellowish-brown), hind tarsus largely, ovipositor sheath, veins largely and pterostigma dark brown; basal 0.6 of hind tibia and hind spurs pale brownish-yellow and tibia without dark brown subbasal spot; palpi, labrum, tegulae and fore and middle legs brownish-yellow; wings moderately infusate.

Variation. Paratype female very similar to holotype, also with 30 antennal segments, length of fore wing 3.0 mm and of body 3.9 mm, length of first metasomal tergite 1.4 times its apical width, ovipositor sheath 0.95 times as long as fore wing and height of eye 1.9 times length of malar space.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name "*fuscistigmalis*" refers to the dark brown ("fuscus" in Latin) pterostigma ("stigma" is Greek for mark).

***Camptothlipsis luteostigmalis* van Achterberg nov. spec.**

Figures 47–55

Specimens examined: Holotype: ♀ (RMNH), "Yemen (no. 2893), Al Kadan (20 km N Bajil). Mal[aise] trap, 3.xii.1997–16.ii.1998, A. v. Harten, RMNH'98". Paratypes: 1♂, al-Kadan, 14.v.1998,



Plate 47. *Camptothlipsis luteostigmalis* van Achterberg nov. spec., female, holotype, Yemen (al-Kadan), habitus, lateral aspect.

ex *Antigastra catalaunalis* on sesame, AvH. 1♀, al-Kowd, 17–21.vii.2001, LT, AvH & S. Al-Haruri. 1♀, Lahj, 1.x–17.xii.2001, MT, AvH & A. Sallam.

Diagnosis. The new species has the pterostigma yellow, the penultimate antennal segments of female about as long as wide, the ovipositor sheath about as long as the metasoma and 0.8 times as long as the fore wing, the second metasomal tergite largely smooth, the marginal cell of fore wing parallel-sided anteriorly (Plate 51) and the head less robust in anterior view (Plate 53). It is similar to *C. curticornis* Granger, 1949, from Madagascar, but the new species has the basal 0.6 of hind tibia pale yellow and without subbasal dark band (ivory and with dark band in *C. curticornis*), the head brownish-yellow (largely blackish or dark brown), the marginal cell parallel-sided (narrowed posteriorly), the first metasomal tergite about 1.2 times as long as its apical width (about 1.5 times) and hind tarsus yellowish-brown (dark brown).

Description: Female, holotype, length of fore wing 3.3 mm and of body 4.7 mm. Head. Antennal segments 29 (partly with indistinct divisions halfway and 0.7 times as long as body), third segment mat, length of third segment 1.4 times fourth segment, length of third, fourth and penultimate segments 3.6, 2.6 and 1.2 times their width, respectively; apical antennal segment 1.4 times as long as penultimate segment; length of maxillary palp 0.7 times height of head; in dorsal view eye 4.3 times as long as temple (Plate 55); POL:OD:OOL = 10:5:8; between antennal sockets with a triangular area; occipital flange narrow; face evenly weakly convex and smooth, with dense setae; clypeus flattened and concave medio-

ventrally and smooth; frons smooth, area above antennal socket distinctly depressed and up to stemmaticum, with median ridge and triangular area in front of anterior ocellus short, wide and shallow; vertex weakly convex and smooth except for some fine punctures; length of malar space 2.4 times as long as basal width of mandible and eye 2.2 times as high as malar space; galea 0.7 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.4 times its height; side of pronotum smooth, but finely crenulate posteriorly and medio-anteriorly; area near lateral carina of mesoscutum smooth; mesoscutum moderately shiny and sparsely punctulate, moderately convex; notauli complete, rather shallow and very finely crenulate (Plate 49); scutellar sulcus 0.25 times as long as dorsal face of scutellum and with 7 short crenulae; scutellum sparsely punctulate and rather convex; precoxal sulcus narrow, finely crenulate and anterior quarter absent (Plate 48); epicnemial area smooth, mesopleuron shiny and nearly entirely smooth; mesosternal suture very finely crenulate, nearly smooth; metapleuron with rather dense setosity and largely smooth, with some punctures and some very superficial micro-sculpture and some rugae ventrally; propodeum densely coarsely punctate and interspaces superficially granulate, but medio-posteriorly largely smooth, with satin sheen, spiracle small and round, lateral carina largely absent. Wings. Fore wing: 2-R1 1.1 times as long as 1-R1; 1-R1 0.5 times as long as pterostigma; pterostigma semi-oval; marginal cell parallel-sided and narrow (Plate 51); $r:SR1:2-SR = 3:45:10$; cu-a slightly postfurcal; basal half of wing with sparse setae and apical half with dense setae. Hind wing: with 4 hamuli; vein M+CU as long as vein 1-M; surroundings of cu-a setose. Legs. Length of hind femur, tibia and basitarsus 3.5, 7.1 and 10.8 times their width, respectively; hind femur smooth and shiny; outer side of middle and hind tibiae with 5 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.4 and 0.5 times middle basitarsus; length of outer and inner spurs of hind tibia 0.35 and 0.45 times hind basitarsus; fore femur and tarsus slender; tarsal claws with medium-sized acute lobe. Metasoma. First tergite moderately widened apically, weakly constricted behind spiracles and 1.2 times as long as its apical width (Plate 50), weakly shiny and rather superficially granulate, dorsal carinae absent; second tergite smooth, with slightly differentiated wide elliptical basal area and posteriorly with obsolescent transverse depression; second tergite as long as third tergite and hardly widened posteriorly (Plate 50); second metasomal suture obsolescent; metasoma largely glabrous, tergites at most with apical row of setae; ovipositor sheath slender (but slightly widened apically) and with medium-sized setae; ovipositor sheath 0.87 times as long as fore wing and 2.2 times as long as hind tibia.

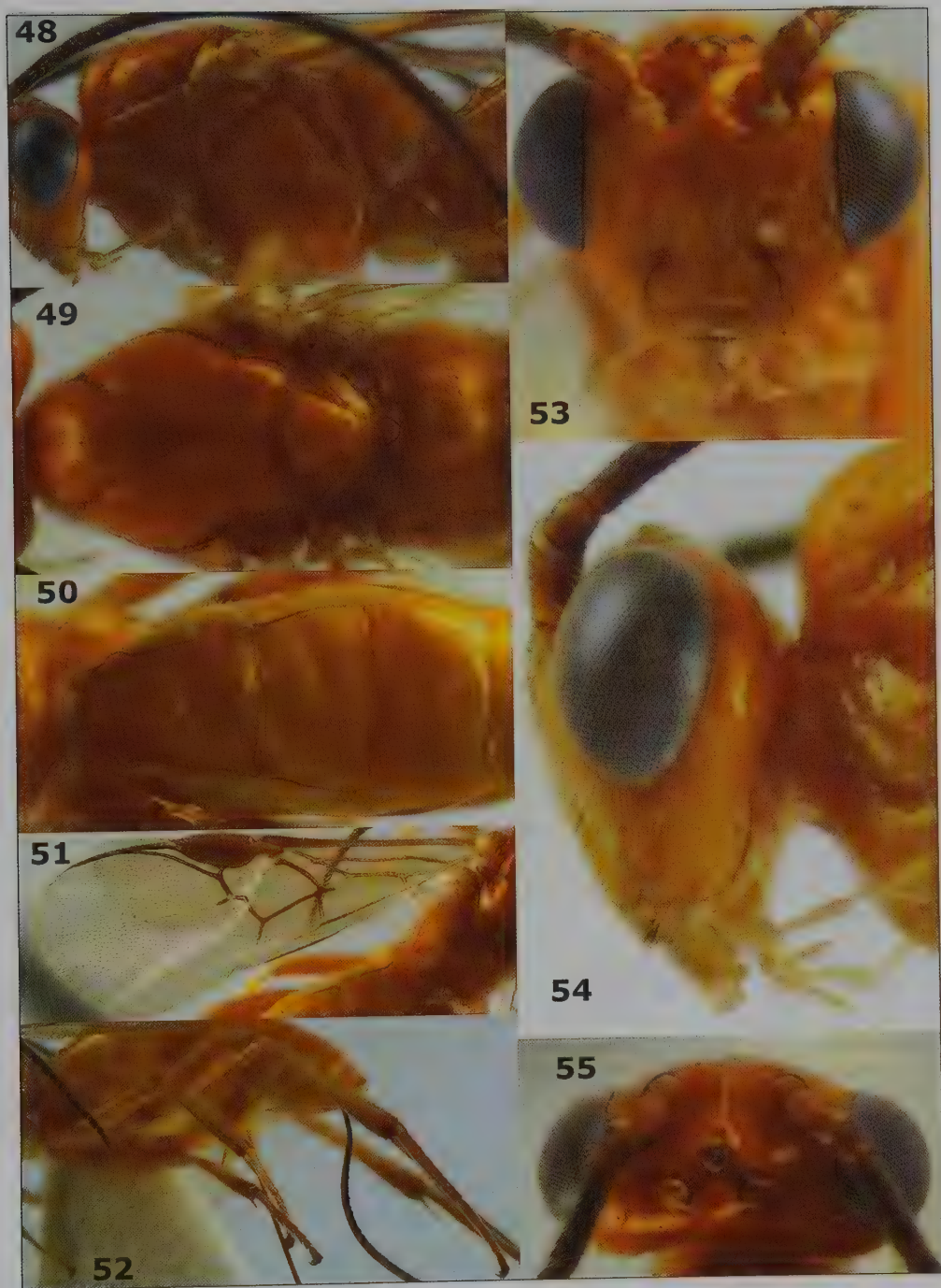
Colour. Brownish-yellow; antenna mainly (but scapus and pedicellus yellowish-brown), and ovipositor sheath dark brown; veins largely brown and pterostigma yellowish-brown; hind tibia without dark brown subbasal spot; palpi, labrum, tegulae and legs pale yellow; wings subhyaline.

Variation. Paratypes are very similar to holotype and females have ovipositor sheath 0.87 times as long as fore wing; female with 28 (1) or 29 (2) antennal segments (antenna of male with 29 segments and penultimate segments slender), length of fore wing 3.2–3.3 mm and of body 4.0–4.7 mm, length of first metasomal tergite 1.0–1.2 times its apical width and height of eye of female 1.9–2.2 times (of male 1.7 times) length of malar space.

Biology. Parasitoid of the sesame leafroller, *Antigastra catalaunalis* (DuPonchel), belonging to the subfamily Crambinae (Lepidoptera: Pyralidae) and a pest of sesame (*Sesamum indicum*). This is a new host record.

Distribution: Yemen.

Etymology: The name "*luteostigmalis*" refers to the yellowish ("*luteus*" in Latin) pterostigma ("*stigma*" is Greek for mark).



Plates 48–55. *Camptothlipsis luteostigmalis* van Achterberg nov. spec., female, holotype, Yemen (al-Kadan). 48: Mesosoma, lateral aspect; 49: Mesosoma, dorsal aspect; 50: First-third metasomal tergites, dorsal aspect; 51: Wings; 52: Hind leg, lateral aspect; 53: Head, anterior aspect; 54: Head, lateral aspect; 55: Head, dorsal aspect.

Genus *Coccygidium* de Saussure, 1892

Figures 56–92

Biology: Unknown of most species, a few times reared from Noctuidae and once from Pyralidae. The species are nocturnal; they come frequently at light.

Key to Arab species of the genus *Coccygidium* de Saussure

- 1 Fore wing with a distinct submedial band or largely dark brown; basal half of pterostigma more or less yellow and contrasting with dark brown apical half (Plate 87); face distinctly rugulose dorsally; Yemen *C. rugiferum* nov. spec.
- Fore wing largely subhyaline or largely infusate, without well separated submedial dark band (apical band may be well differentiated); basal half of pterostigma dark brown or narrowly yellow (Plates 60, 69, 78), **if** contrasting with its dark brown apical half **then** face largely smooth 2
- 2 Mesoscutal lobes dark brown medially (Plate 67); apex of hind femur dark brown dorsally; hind femur moderately and densely rugose ventrally; anteriorly propodeum partly smooth and shiny; UAE *C. maculatum* nov. spec.
- Mesoscutal lobes yellowish-brown medially (Plates 58, 76); apex of hind tibia brown brownish-yellow; hind femur rather coarsely and less densely rugose ventrally; anteriorly propodeum finely sculptured and rather mat 3
- 3 Apex of hind tibia black or dark brown and well differentiated from remainder of tibia (Plate 61); hind leg largely yellowish-brown; OOL and POL of female 0.7–1.1 times diameter of posterior ocellus (Plate 64); vein 1-M moderately to weakly bent posteriorly (Plate 60); height of eye 3.8–5.2 times malar space; basal cell near vein 1-M of fore wing usually densely setose; hind tibia comparatively slender (Plate 61); Afrotropical, Yemen ..
..... *C. luteum* (Brullé, 1846)
- Apex of hind tibia yellowish-brown (Plate 79), if distinctly darkened then not well differentiated from remainder of tibia; hind leg largely brown; OOL and POL of female 0.4–0.7 times diameter of posterior ocellus (Plate 82; of male about 0.9 times); vein 1-M of fore wing gradually bent (Plate 78); height of eye 7.2–9.2 times as long as malar space; basal cell near vein 1-M of fore wing sparsely setose; hind tibia comparatively robust and distinctly widened apically (Plate 79); Afrotropical, UAE, Yemen
..... *C. melleum* (Roman, 1910) nov. comb.

Coccygidium luteum (Brullé, 1846)

Plates 56–64

Agathis lutea Brullé, 1846: 506. (type lost; described from Ile de France [= Mauritius] and Ile de Bourbon [= Réunion]).

Disophrys lutea; Fahringer, 1937: 438; Shenefelt, 1970: 398.

Coccygidium luteum; de Saussure, 1892: pl. 15–27.

Brachyopalum pallidum Kriechbaumer, 1894: 312; Shenefelt, 1970: 399. Synonymized by Enderlein (1920). Examined.

Coccygidium pallidum; Chou & Sharkey, 1989: 178.

Neophylax snyderi Ashmead, 1900: 119. **Nov. syn.** Examined.

Zelomorpha snyderi; Shenefelt, 1970: 427.

Coccygidium snyderi; Chou & Sharkey, 1989: 178.

Xanthomicrodus iridipennis Cameron, 1904: 158. **Nov. syn.** Examined.

Zelomorpha iridipennis; Shenefelt, 1970: 426.

Coccygidium iridipennis; Chou & Sharkey, 1989: 178.

Microdus? ambiguus Kohl, 1906: 128; Fahringer, 1937: 438; Shenefelt, 1970: 398. Synonymized by Granger (1949). Examined; lectotype (female, NMW: “Sokótra, ii.[18]99, O. Simony”,



Plate 56. *Coccygidium luteum* (Brullé), female, Yemen (Ta'izz), habitus, lateral aspect.

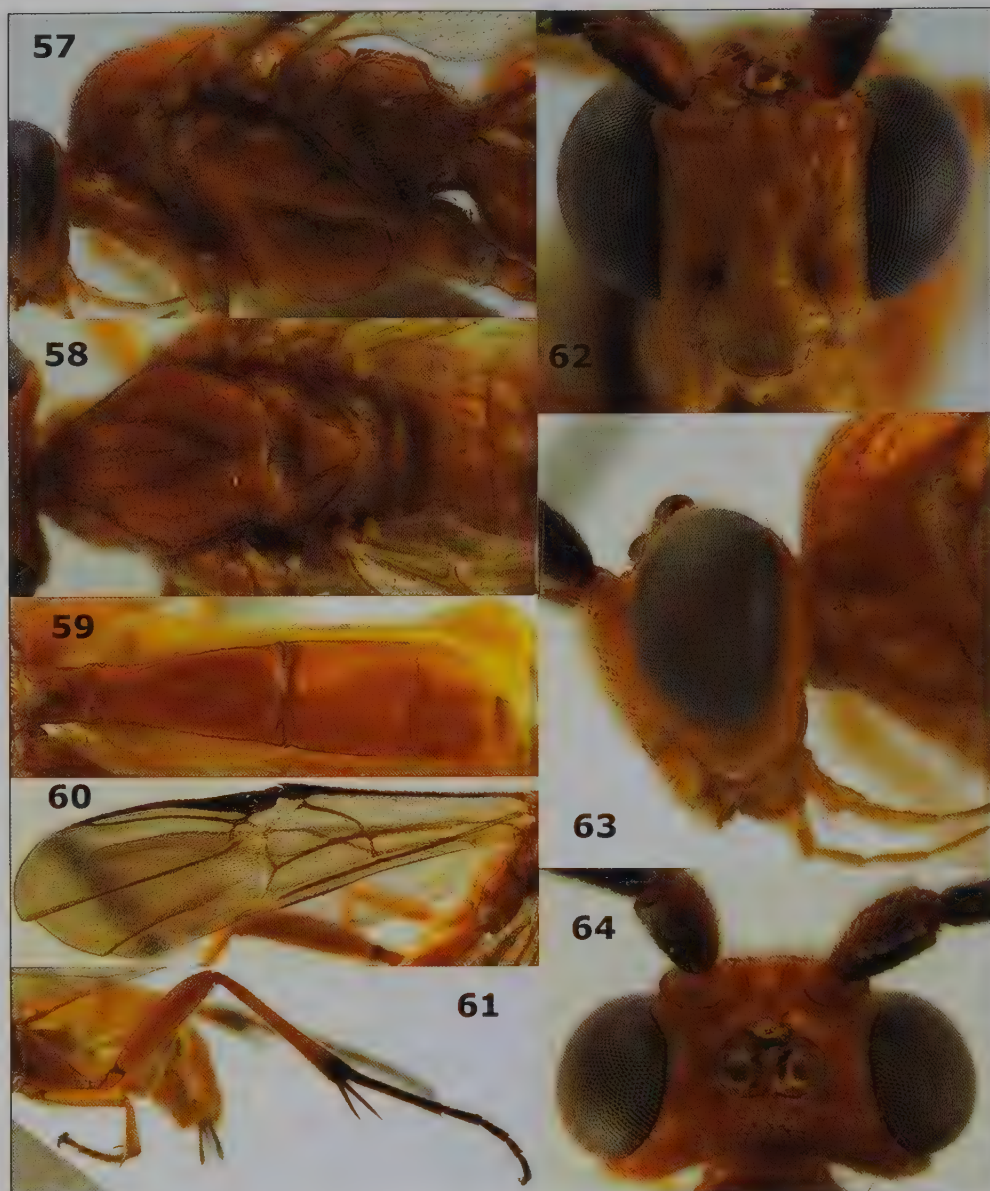
"*ambiguus*", type, det. Kohl) here designated, because it fits best the original description and has a better condition than the paralectotype. The female paralectotype (NMW) from Aden (xii.1898) belongs to *C. melleum* (Roman).

Megagathis testacea Cameron, 1908: 82; Shenefelt, 1970: 399. Synonymized by Granger (1949).

Holotype from Seychelles (female, BMNH) examined.

Xanthomicrodus pallidinervis Cameron, 1912: 379; Shenefelt, 1970: 399. Synonymized by Brues (1926). Specimens examined only from Yemen: Al-Lahima, 16.x–31.xii.2000, 1.i–9.iv.2001 and 14.xi.2001–6.iii.2002, all MT, AvH. Al-Kadan 3.xii.1997–16.ii.1998, 16.ii–31.iii.1998, MT, AvH & H.M. Naser; ix.2001 and i.2003, LT, AvH & T. Abdul-Haq. Al-Kowd, ix.2003, LT, AvH & S. Al-Haruri. Ar-Rujum, 16.x.2000–15.i.2001 and 15.i–9.iv.2001, MT, AvH. Ta'izz 5.i–2.ii.1998, 26–28.v.1998, viii.1999, xi.1999, v–vi.2000 and x.2001; all LT, AvH, A. Awad & A.R. Al-Yarimi. Al-Mukalla, i–ii.2003, LT, AvH & M. Hubaishan. Lahj, iv.1999, MT, AvH & A. Sallam. 12 km NW of Manakhah, 15.vi–23.vi.2003, 24.vi–4.viii.2003, 15.ix–22.x.2003 and 22.x–3.xii.2003, MT, AvH. 1♀, Hammam 'Ali, 14.viii.2001, reared from *Prophantis* spec. (coffee berry moth), AvH.

Remarks: Very common species in the Afrotropical region and reaching Yemen, but not UAE. Very similar to *C. transcaspicum* (Kokujev, 1902) from Central Asia and up to Iran, but the latter lacks the blackish apex of the hind tibia. The wings are completely subhyaline or largely faintly infuscate, the anterior half of vein 1-M of the fore wing brown, grey or pale brown, rarely dark brown, the malar space 0.9–1.2 times basal width of the mandible (and 0.5–0.8 times maximum width of the scapus), about as long as distance between the anterior tentorial pit and the base of the mandible, setose part of the ovipositor sheath 0.5 times hind basitarsus, the hind coxa largely rugulose or coriaceous dorsally, the clypeus slightly protruding below lower level of eyes, the groove between the posterior ocelli often deep and vein 1-M of fore wing usually weakly bent posteriorly. The report of this species from Israel (Papp, 1989) may refer to *C. luteum*. Parasitoid of Noctuidae (including *Spodoptera* spp.) and Pyralidae–Crambinae (*Prophantis* spec.).



Plates 57–64. *Coccygidium luteum* (Brullé), female, Yemen (Ta'izz). 57: Mesosoma, lateral aspect; 58: Mesosoma, dorsal aspect; 59: First–third metasomal tergites, dorsal aspect; 60: Wings; 61: Hind leg, lateral aspect; 62: Head, anterior aspect; 63: Head, lateral aspect; 64: Head, dorsal aspect.

Coccygidium maculatum* van Achterberg *nov. spec.

Plates 65–73

Specimens examined: Holotype: ♀ (RMNH), “United Arab Emirates, Sharjah Desert Park (7567), 27°17'N, 55°42'E, 17.ii.–3.iii.2007, light trap, A. v. Harten, RMNH'07”. Paratypes (38♂ + 22♀): 2♀, sama data as holotype. Sharjah Desert Park: 1♀, 18–25.i.2005; 1♀, 25.i.–22.ii.2005; 1♂, 22.ii.–9.iii.2005; 1♀, 21–29.iii.2005; 3♂, 29.iii.–6.iv.2005; 1♂, 6–13.iv.2005; 1♂, 23–30.iv.2005; 1♂, 30.iv.–



Plate 65. *Coccygidium maculatum* van Achterberg nov. spec., female, holotype, UAE (Sharjah Desert Park), habitus, lateral aspect.

31.v.2005; 1♂, 30.vi–21.vii.2005; 1♂, 2♀, 20.x–8.xi.2005; 3♂, 4♀, 11.xii.2005–18.i.2006; 1♀, 25.ii–25.iii.2006; 1♂, 1–25.ii.2006; 2♂, 1–8.iv.2007; 3♂, 1♀, 20.x.–24.xi.2007; 1♂, 10–17.iii.2007; 2♂, 22–30.iv.2007; all LT, AvH. Al-Ajban: 1♂, 17.x–9.xi.2005, LT; 1♂, 22.x–9.xi.2005, MT; 2♂, 1.iv.–2.v.2006, MT; 2♂, 1♀, 7–28.xii.2006, LT + MT; 1♂, 26.ii–2.iv.2006, MT; 4♂, 1♀, 25.v–26.vi.2006, MT; all AvH. SSW of ad-Dhaid: 1♂, 23.iv.2005, LT; 1♂, 1♀, 2–14.ix.2006, LT; all AvH. Fujairah: 1♀, 29.xi.2005–2.i.2006, LT, AvH. Wadi Madaq: 1♀, 21.xii.2005–2.ii.2006, LT; 2♀, 21.ii–4.iii.2006, LT; all AvH. NARC, near Sweihan: 1♂, 1♀, 18–28.iii.2005, LT; 1♀, 2–9.iv.2005, LT; 1♂, 2♀, 9–20.iv.2005, LT; all AvH.

Diagnosis: The new species is unique by having the mesoscutal lobes dark brown medially; apex of hind femur dark brown dorsally; hind femur moderately and densely rugose ventrally; anteriorly propodeum partly smooth and shiny and basal cell of fore wing very sparsely setose.

Description: Female, holotype, length of fore wing 7.5 mm and of body 8.8 mm. Head. Antennal segments 43; apical spiny setae of antennal segments straight; length of third segment 1.2 times fourth segment, length of third, fourth and penultimate segments 2.6, 2.2 and 1.6 times their width, respectively; apical antennal segment (including distinct spine) 1.7 times as long as penultimate segment; length of maxillary palp 0.8 times height of head; in dorsal view length of eye 20 times temple (Plate 73); POL:OD:OOL = 3:5:3; occipital flange medium-sized (Plate 72); face evenly setose and mainly smooth, depressed laterally and medio-dorsally; clypeus smooth and ventrally concave; frons smooth, with two strong curved crests between antennal sockets, with shallow median groove in front of anterior ocellus and shallowly impressed behind antennal sockets; vertex smooth, vertical and setose behind stemmaticum; malar space 0.8 times as long as basal width of mandible and eye in lateral view 7.2 times as long as malar space. Mesosoma. Length of mesosoma 1.2 times its height; side of pronotum smooth, but finely crenulate posteriorly; area near lateral carina of mesoscutum smooth; mesoscutum densely punctate (interspaces about equal to punctures),



Plates 66–73. *Coccygidium maculatum* van Achterberg nov. spec., female, holotype, UAE (Sharjah Desert Park). 66: Mesosoma, lateral aspect; 67: Mesosoma, dorsal aspect; 68: First–third metasomal tergites, dorsal aspect; 69: Wings; 70: Hind leg, lateral aspect; 71: Head, anterior aspect; 72: Head, lateral aspect; 73: Head, dorsal aspect.

with dense setosity and with pair of submedian grooves on middle lobe; anterior half of notauli shallow and indistinctly micro-crenulate (Plate 67) and remainder smooth and shallow; scutellar sulcus 0.6 times as long as dorsal face of scutellum and with one long and four short carinae; scutellum rather densely punctate, weakly convex and with lateral carina; mesopleuron shiny and largely punctate, with interspaces somewhat wider than punctures; pleural sulcus finely crenulate; mesosternal sulcus smooth; posterior half of precoxal sulcus present, narrowly crenulate (Plate 66); metapleuron coarsely punctate and ventrally with some ruga; propodeum distinctly areolate and interspaces mainly smooth and shiny but laterally with some rugae, with a submedial transverse carina and no median carina, spiracle large, elliptical; lateral carina of propodeum wide lamelliform and complete. Wings. Fore wing: second submarginal cell pentagonal (Plate 69); 1-M strongly bent posteriorly; basal cell with sparse setae; $r:3\text{-SR:SR1} = 5:5:101$; 2-R1 0.4 times 1-R1 ; $2\text{-SR:3-SR:r-m} = 11:5:13$; vein cu-a distinctly antefurcal, vertical. Hind wing: 2-SR+M quadrate; $M+CU:1\text{-M} = 30:43$; surroundings of cu-a glabrous. Legs. Length of hind femur, tibia and basitarsus 4.0, 7.0 and 7.6 times their width, respectively; hind femur (as remainder of legs) with short and dense setosity, moderately and densely rugose ventrally; outer side of middle tibia without pegs except for a cluster of 3 pegs at apex; outer side of apex of hind tibia with a cluster of 9 pegs; length of outer and inner spurs of middle tibia 0.6 and 1.0 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.6 times hind basitarsus, respectively; second–fifth fore tarsal segments slender; hind coxa superficially rugulose dorsally. Metasoma. First tergite slightly contracted behind spiracles and rather flat, 1.7 times as long as its apical width (Plate 68), only lamelliform postero-laterally, smooth and dorsal carinae of first tergite absent; second and third tergites smooth; second tergite 0.8 times longer than its basal width and about as long as third tergite; second metasomal suture obsolescent; third tergite concave and desclerotised posteriorly; tergites with line of setae apically; ovipositor sheath 0.09 times as long as fore wing.

Colour. Pale brownish-yellow; antenna (but scapus and pedicellus mainly brown), lobes of mesoscutum largely, scutellum laterally, ovipositor sheath basally, hind femur apico-dorsally and hind tibia apically dark brown, remainder of sheath brown; labrum, palpi, tegulae and metasoma ventrally pale yellow; wings subhyaline and veins largely brown (Plate 69); parastigma, 1-M anteriorly and pterostigma posteriorly dark brown; remainder of pterostigma yellowish-brown; hind tarsus and hind spurs infusate.

Variation. Antennal segments of female 40 (2), 41 (9), 42 (10), 43 (5) or 44 (1), of male 39 (1), 40 (6), 41 (12) or 42 (4); length of fore wing of female 5.6–7.5 mm (of male 4.2–6.1 mm); length of body of female 6.5–8.8 mm (of male 5.0–7.5 mm); first metasomal tergite 1.6–1.9 times its apical width.

Biology: Unknown.

Distribution: United Arab Emirates.

Etymology: The name “*maculatum*” refers to the dark spots (“macula” in Latin means spot or mark) of the mesoscutum.

***Coccygidium melleum* (Roman, 1910) nov. comb.**

Plates 74–82

Disophrys mellea Roman, 1910: 121; Fahringer, 1937: 439; Shenefelt, 1970: 399.

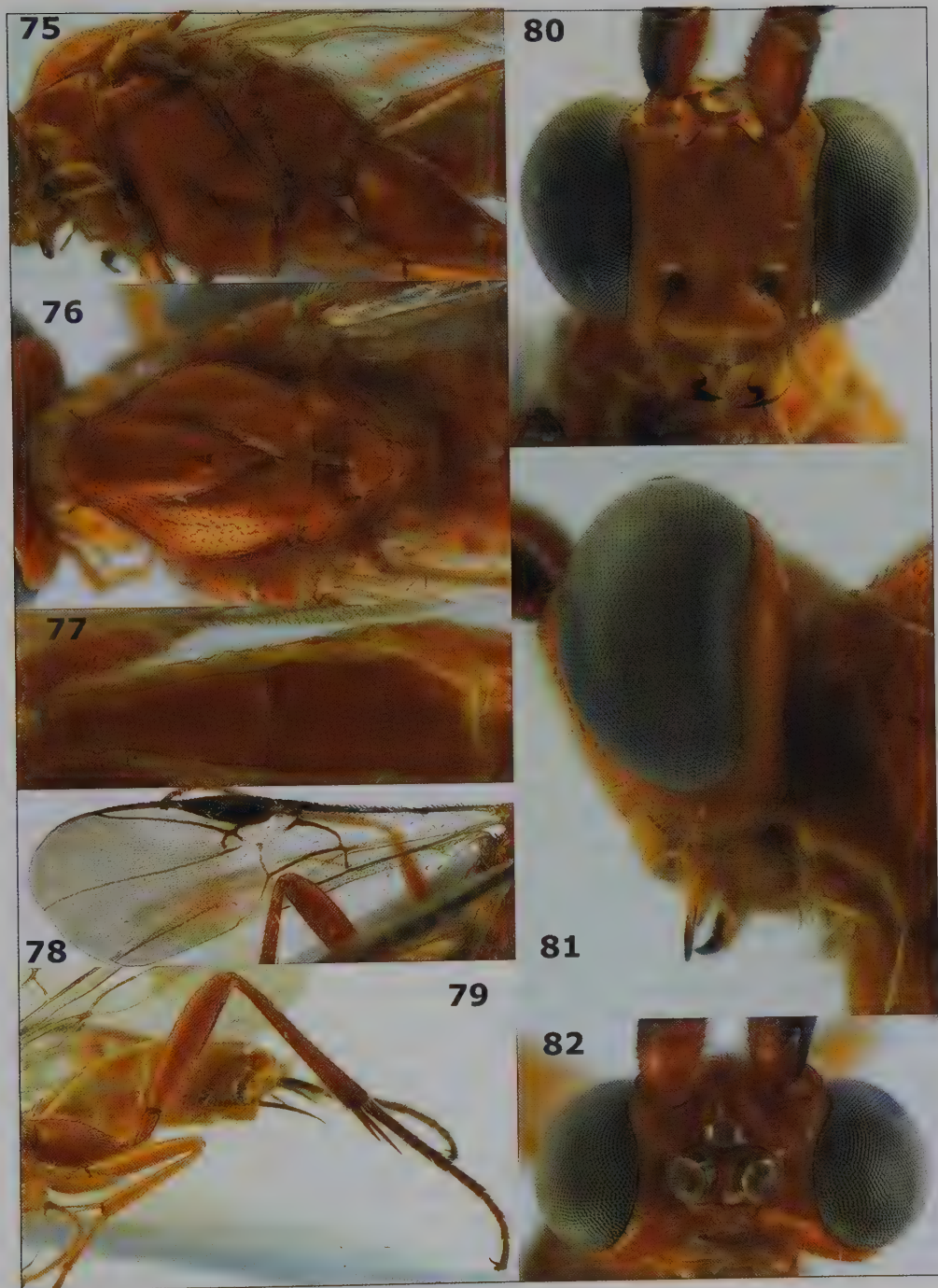
? *Zelomorpha sudanensis* Gahan, 1928: 255; Shenefelt, 1970: 427.

Specimens examined from the UAE: Al-Ajban, 22.x–9.xi.2005; 25.iii–2.iv.2006; 12–19.vi.2006; 26.v–25.vi.2006; 1.iv–2.v.2006; 29.xi–27.xii.2006; 2–11.xi.2006; 7–28.xii.2006; 26.ii–2.iv.2006; 25.v–26.vi.2006; 25.vi–21.viii.2006; 28.xii.2005–29.i.2006; 25.viii–19.ix.2006 all LT, AvH; 26.ii–27.iii.2006, MT, AvH. N of Ajman, 11–19.iii.2009, leg. C. Schmid-Egger. Bithnah, 11.xii.2005–.



Plate 74. *Coccygidium melleum* (Roman), female, UAE (Sharjah Desert Park), habitus, lateral aspect.

18.i.2006, LT, AvH. SSW of ad-Dhaid, 2–14.ix.2006, LT, AvH. Fujairah, 5–24.iii.2005; 13–19.iv.2005; 19.iv–2.v.2005; 2–13.v.2005; 2.v–5.vi.2005; 13–29.xi.2005; 29.xi.2005–2.i.2006; 2–30.i.2006; 28.ii–1.iv.2006; 20–27.v.2006; all LT, AvH. Hatta, 19–28.iii.2006, LT, AvH; 17–24.viii.2006, LT, AvH. Khor al-Khwair, 8.iii–2.iv.2007; 7.iv–1.v.2007; all LT, AvH. Near Mahafiz, 21–28.iii.2006, LT. 10 km SW of Ra's al-Khaimah Airport, 11–19.iii.2009, leg. C. Schmid-Egger. Sharjah, 30.vi–21.vii.2005, LT, AvH. Sharjah Desert Park, 18–25.i.2005; 25.i–22.ii.2005; 22.ii–9.iii.2005; 21–29.iii.2005; 29.iii–6.iv.2005; 6–13.iv.2005; 13–23.iv.2005; 23–30.iv.2005; 30.iv–7.v.2005; 30.iv–31.v.2005; 20.x–8.xi.2005; 11.xii.2005–18.i.2006; 20–21.iv.2006; 25.ii–25.iii.2006; 1–25.ii.2006; 17.ii–3.iii.2007; 15–22.iv.2007; 1–8.iv.2007; 10–17.iii.2007; 22–30.iv.2007; all LT, AvH. Sharjah-Khor Kalba, near tunnel, 17–18.iv.2006; 31.v–7.vi.2006; 16–31.i.2006; all LT, AvH. NARC, near Sweihan, 28.iii–2.iv.2005; 2–9.iv.2005; 9–20.iv.2005; 20–30.iv.2005; all LT, AvH. Wadi Bih dam, 22.ii–1.iii.2007; 24.iv–1.v.2007; 6–17.iii.2008; 9–26.vi.2008; 24.iv–23.v.2007; all LT, AvH; 25.ii–8.iii.2009, MT, AvH; 22–26.iii.2009, WT, AvH. Wadi al-Helo, 11–19.iii.2009, leg. C. Schmid-Egger. Wadi Madaq, 21.xii.2005–2.ii.2006, LT; 7–14.iii.2006, LT; 27.iv–4.v.2006, LT; 26.xii.2006–20.i.2007, MT; 14–25.i.2006, WT; 2–26.i.2006, WT; all AvH. Wadi Safad, 14–21.v.2006; 1–8.vii.2006; 31.i–21.ii.2006; 21.ii–4.iii.2006; 26.xii.2005–2.i.2006; all LT, AvH; 22.ii.2006, at light, leg. C. Gielis. Wadi Wurayah, 12–14.iv.2005, MT & WT, leg. T. Pape. Wadi Wurayah farm, 15.i–22.ii.2009, LT; 17–24.iii.2009, MT; all AvH. OMAN: Qurum, Sultan Qaboos Park, 8–9.iv.1982 at light. YEMEN: Amran, 4.x.2003, ex *Sesamia* spec., AvH. Al-Kadan, 8–12.vii.2001; x.2001; xi.2001; iv.2002; v.2002; ix.2001; all LT, AvH & T. Abdul Haq. Al-Kowd, vii.1999; viii.1999, ix.1999; xii.1999; v–vi.2000; vii.2000; viii.2000; xii.2000; ii.2001; 6–10.viii.2001; 21–25.viii.2001; 27–31.vii.2001; 16–20.viii.2001; 1–5.ix.2001; ix–x.2001; vii–ix.2001; i–iii.2003; ix.2001; ix.2003; all LT, AvH & S. Al Haruri. Al-Lahima, 16.x–31.xii.2000; 1.i–9.iv.2001; 9.iv–5.vi.2001; 17.ix–14.xi.2001; all MT, AvH. Lahj, x.1998; i.2001; all MT, AvH & A. Sallam. Ma'bar, 8.vii.1992, AvH. 12 km NW of Manakhah, 3.vii–21.viii.2001; 24.vi–4.viii.2003; 15.ix–



Plates 75–82. *Coccygidium melleum* (Roman), female, UAE (Sharjah Desert Park). 75: Mesosoma, lateral aspect; 76: Mesosoma, dorsal aspect; 77: First–third metasomal tergites, dorsal aspect; 78: Fore wing; 79: Hind leg, lateral aspect; 80: Head, anterior aspect; 81: Head, lateral aspect; 82: Head, dorsal aspect.

22.x.2003; all MT, AvH. Al-Mukalla, vii–viii.2003, LT, AvH & M. Hubaishan. Qa al-Boun, 8.vii.1992, AvH. Ar-Rujum, 16.x.2000–15.i.2001; 9.iv–5.vi.2002; all MT, AvH. Sana'a, vii.1998, MT, AvH. Seyun, vi.2002; 4–6.ix.2002; all LT, AvH & G. Ba Saheh. Suq Bani Mansour, 28.viii–14.xi.2001; 14.xi–28.xii.2001; all MT, AvH. Ta'izz, 5.i–2.ii.1998; 1–3.iv.1998; 3–24.i.1999; 26–28.vii.1999; viii.1999; ix.1999; xi.1999; vii.2000; ix.2000; viii.2000; ix–x.2001; iii–iv.2001; vi.2002; vii.2002; all LT, AvH, A. Awad & A.R. Al-Yarimi.

Remarks: Common species in the Afrotropical region (from South Africa up to Senegal and Somalia) and reaching Yemen and the UAE. Similar to *C. luteum* (Brullé), but the latter has the apex of the hind tibia blackish. The hind femur is entirely or largely brownish and less narrowed basally (Plate 79), the pterostigma dark brown, but sometimes with a small yellowish patch basally, anterior half of the vein 1-M of the fore wing dark brown to pale yellowish, setose part of the ovipositor sheath 0.5 times as long as the hind basitarsus in large specimens and up to 0.7 times in small specimens and apically yellowish-brown, the clypeus distinctly protruding below lower level of eyes and the fore wing slightly more setose basally than in *C. luteum*.

Biology: Parasitoid of Noctuidae (*Sesamia* spec.).

Distribution: United Arab Emirates, Yemen, Oman and probably main part of Afrotropical region.

Coccygidium rugiferum* van Achterberg *nov. spec.

Plates 83–92

Specimens examined: Holotype: ♀ (RMNH), "Yemen, Al Lahima, 1.1–9.4.2001, no. 5486, Mal[aise] trap, A. v. Harten, A.M. Hager, RMNH'01". Paratypes from Yemen (3♂, 7♀): 1♀, al-Lahima, 1.i–9.iv.2001; 2♂, 2♀, 9.iv–5.vi.2001; 1♀, 16.x–31.xii.2000; 1♀, 14.xi.2001–6.iii.2002; all MT, AvH & A.M. Hager. 1♀, al-Kadan, x.2001, LT, AvH & T. Abdul-Haq. 1♀, 12 km NW of Manakhah, 27.iii–5.v.2002; 1♀, 22.x–3.xii.2003; all MT, AvH. 1♀, Sana'a, v.1999, LT, AvH. 1♀, Ta'izz, x.2001; 1♀, viii.1999; 1♀, vii.2002; 1♂, 3♀, viii.2000; all LT, AvH & A.R. Al-Yarimi.

Diagnosis: Fore wing with a distinct submedial band or largely dark brown; basal half of pterostigma more or less yellow and contrasting with dark brown apical half; face distinctly rugulose dorsally; height of eye 5.2–5.6 times malar space; OOL 0.9 times diameter of posterior ocellus; first tergite with short dorsal carinae; hind tibia completely yellowish-brown; hind tarsus dark brown. Closely related to *C. fraudator* (Szépligeti, 1913) **nov. comb.** from Madagascar. The new species has the fore wing pale yellowish basally (subhyaline in *C. fraudator*), submedial band and apex of fore wing dark brown (rather faintly darkened); apical half of pterostigma dark brown (apical third of pterostigma weakly infuscate, remainder yellow), precoxal sulcus long and finely crenulate (weakly developed and slightly narrowly crenulate) and hind tarsus dark brown (mainly yellowish-brown).

Description: Female, holotype, length of fore wing 8.4 mm and of body 10.1 mm. Head. Antennal segments 46; apical spiny setae of antennal segments curved; length of third segment 1.1 times fourth segment, length of third, fourth and penultimate segments 2.7, 2.5 and 1.6 times their width, respectively; apical antennal segment (including distinct spine) 1.8 times as long as penultimate segment; length of maxillary palp 0.8 times height of head; in dorsal view length of eye 13 times temple (Plate 91); POL:OD:OOL = 7:10:9; occipital flange wide and area above it striate (Plate 90); face evenly setose and dorsally rugulose, remainder punctulate, convex laterally; clypeus smooth and ventrally concave; frons smooth, with two rather weak curved crests between antennal sockets, shallowly concave in front of anterior ocellus and moderately impressed behind antennal sockets; vertex smooth except some punctures near eyes, vertical and setose behind strongly protruding stemmaticum; malar space as long as basal width of mandible and eye in lateral view 4.7 times as long as malar space. Mesosoma. Length of mesosoma 1.5 times its height; side of pronotum smooth, but finely crenulate posteriorly; area near lateral carina of mesoscutum narrowly crenulate;

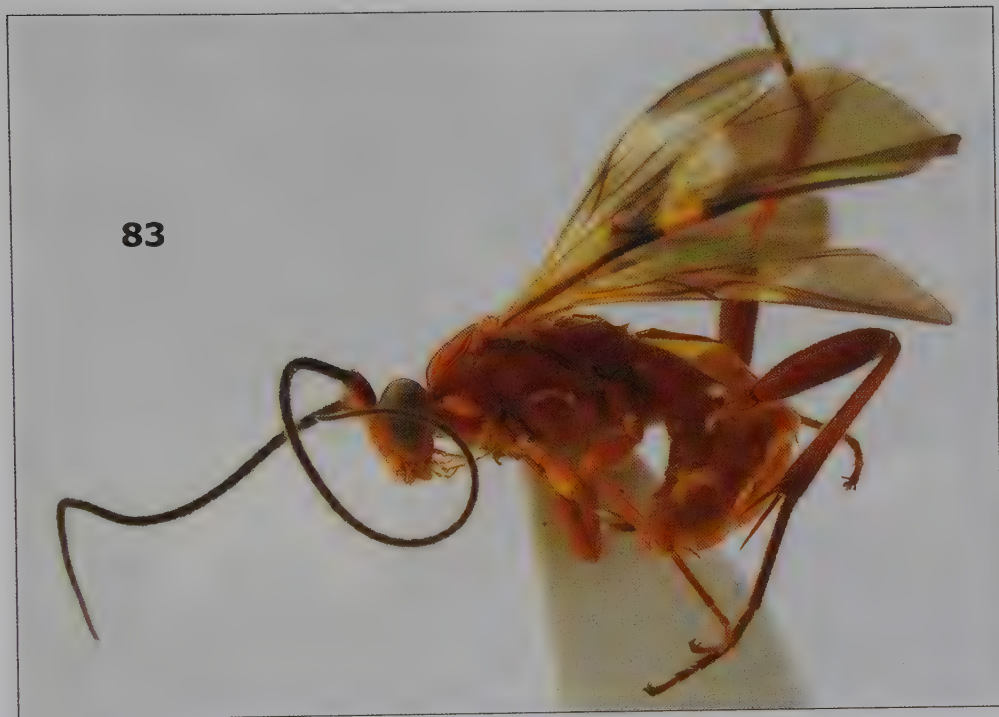
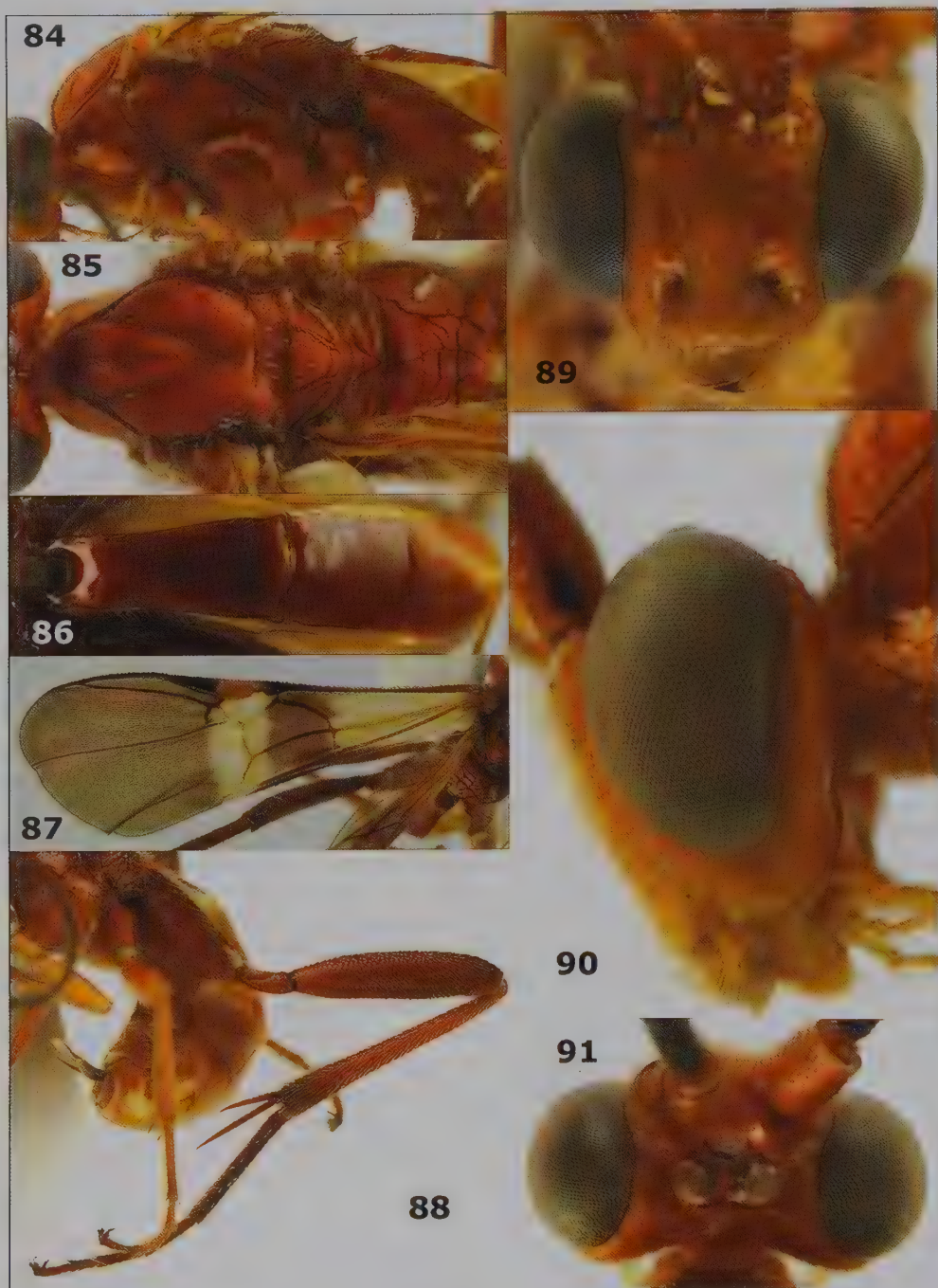


Plate 83. *Coccygidium rugiferum* van Achterberg nov. spec., female, holotype, Yemen (al-Lahima), habitus, lateral aspect.

mesoscutum sparsely punctate (interspaces much wider than punctures) but more densely so anteriorly and medio-posteriorly obliquely striate, with moderately dense setosity and with pair of submedian grooves on middle lobe largely obsolescent; notauli shallow but complete and distinctly crenulate (Plate 85); scutellar sulcus 0.8 times as long as dorsal face of scutellum and with three long carinae; scutellum rather densely and coarsely punctate, flat and with lateral carina; mesopleuron shiny and punctulate dorsally, below precoxal sulcus densely coarsely punctate, with interspaces somewhat wider than punctures or less, anteriorly rugose; precoxal sulcus nearly complete and distinctly narrowly crenulate; pleural sulcus distinctly crenulate; mesosternal sulcus narrowly crenulate; metapleuron coarsely reticulate-rugose; propodeum distinctly areolate and interspaces mainly smooth and shiny but anteriorly finely and densely rugulose, with a submedial transverse carina and a short median carina (Plate 85), spiracle large, elliptical; lateral carina of propodeum wide lamelliform and complete. Wings. Fore wing: second submarginal cell pentagonal (Plate 87); 1-M moderately bent posteriorly; basal cell with fairly dense setosity near vein 1-M; $r:3-SR:SR1 = 5:6:134$; $2-R1$ 0.3 times 1-R1; $2-SR:3-SR:r-m = 15:5:16$; vein cu-a slightly antefurcal, vertical. Hind wing: $2-SR+M$ slightly longer than wide; $M+CU:1-M = 1:2$; surroundings of cu-a glabrous. Legs. Length of hind femur, tibia and basitarsus 4.5, 7.9 and 9.6 times their width, respectively; hind femur densely rugulose, with rather short and dense setae, coarsely and densely rugose ventrally; outer side of middle tibia without pegs except for a cluster of 2 pegs at apex; outer side of apex of hind tibia with a cluster of 3 pegs; length of outer and inner



Plates 84–91. *Coccygidium rugiferum* van Achterberg nov. spec., female, holotype, Yemen (al-Lahima).
 84: Mesosoma, lateral aspect; 85: Mesosoma, dorsal aspect; 86: First-third metasomal tergites, dorsal aspect; 87: Fore wing; 88: hind leg, lateral aspect; 89: Head, anterior aspect; 90: Head, lateral aspect; 91: Head, dorsal aspect.



Plate 92. *Coccygidium rugiferum* van Achterberg nov. spec., female, melanistic paratype, Yemen (Ta'izz), habitus, lateral aspect.

spurs of middle tibia 0.6 and 1.0 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.5 and 0.8 times hind basitarsus, respectively; second–fifth fore tarsal segments elongate; hind coxa largely distinctly rugose dorsally. Metasoma. First tergite hardly contracted behind spiracles and rather flat, 2.2 times as long as its apical width (Plate 86), only shortly lamelliform postero-laterally, smooth and dorsal carinae of first tergite short; second and third tergites smooth; second tergite 1.2 times longer than its basal width and about as long as third tergite; second metasomal suture obsolescent; third tergite deeply

concave and desclerotised posteriorly; tergites with line of setae apically; ovipositor sheath 0.11 times as long as fore wing.

Colour. Yellowish-brown; antenna (but scapus and pedicellus mainly yellowish-brown), ovipositor sheath basally, hind tarsus, apical half of fore wing and wide band near parastigma, vein 1-M and apical half of pterostigma dark brown, remainder of sheath brown and remainder of pterostigma yellow (Plate 87); clypeus, labrum, malar space, palpi, tegulae, fore and middle legs and metasoma apically and ventrally pale yellow; fore wing basally and band below base of pterostigma pale yellowish and veins in this area yellow (Plate 87); apex of hind tibia slightly infusate.

Variation. Antennal segments of female 44 (5), 45 (1), 46 (2), 47 (3), 48 (1) or 49 (1), of male 43 (1), 45 (1) or 48 (1); length of fore wing of female 7.0–8.1 mm (of male 6.1–7.5 mm); length of body of female 7.5–9.9 mm (of male 7.3–7.9 mm); first metasomal tergite 1.6–2.3 times its apical width; height of eye 4.7–5.6 times malar space; hind femur slender but sometimes more robust. Specimens from Ta'izz and Sana'a are melanistic with below pterostigma a narrow pale band (Plate 92) or without a band, basal half of pterostigma more or less blackish, scapus largely black (but intermediates occur) and length of fore wing 7.4–9.0 mm. Typical specimens have a wide pale band below the pterostigma, basal half of pterostigma yellow, scapus brown with a blackish patch and fore wing 6.1–8.1 mm.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name "*rugiferum*" refers to the rugulose ("ruga" in Latin means wrinkle) face ("ferum" in Latin is a suffix meaning carrying or having).

Genus *Cremnops* Foerster, 1862

Cremnops monochroa Szépligeti, 1913

Plates 93–101

Cremnops monochroa Szépligeti, 1913: 603; Shenefelt, 1970: 387.

Cremnops frustalis Nixon, 1956: 130; Shenefelt, 1970: 385. **Nov. syn.**

Note. Only one species of the genus *Cremnops* seems to occur in the dry parts of the Afrotropical region. It ranges from South Africa, East Africa and Madagascar up to Yemen (2 females from 12 km NW of Manakhah (Malaise trap, 24.vi–4.viii.2003 and 4.viii–15.ix.2003); also reported from Aden by Granger (1949) and Madl (2007). It has been reared (as *C. frustalis* Nixon) from the karoo moth (*Epasciestria frustalis* (Zeller, 1852)), a Pyralid pest that is known up to Kenya, but it may occur more north as indicated by the discovery of its parasitoid in Yemen. It is characterized by the long setae on the maxillary palp segments (about as long as second segment of palp; Plate 100) and the dorsally dull and rugose-reticulate hind coxa. The colour of the head is variable; varies from completely yellowish-brown in specimens from Yemen and East Africa and Madagascar to largely darkened dorsally in some South African specimens.

Cremnops testaceus Pérez, 1907

Cremnops testaceus Pérez, 1907: 502; Fahringer, 1937: 424–423; Shenefelt, 1970: 389 [male holotype probably lost; not found in Pérez collection in Paris].

Note: Described from Dibba (= coastal area of part of Oman and of the UAE). Probably not a *Cremnops* species because it has according to the original description brownish antenna with the scapus and the pedicellus reddish, the mesoscutal lobes tuberculate, the wings subhyaline except for some slight infuscations and the body is about 7 mm. Resembles a small male of a *Coccygidium* species, but without type specimen at hand impossible to identify and is considered to be a nomen dubium.

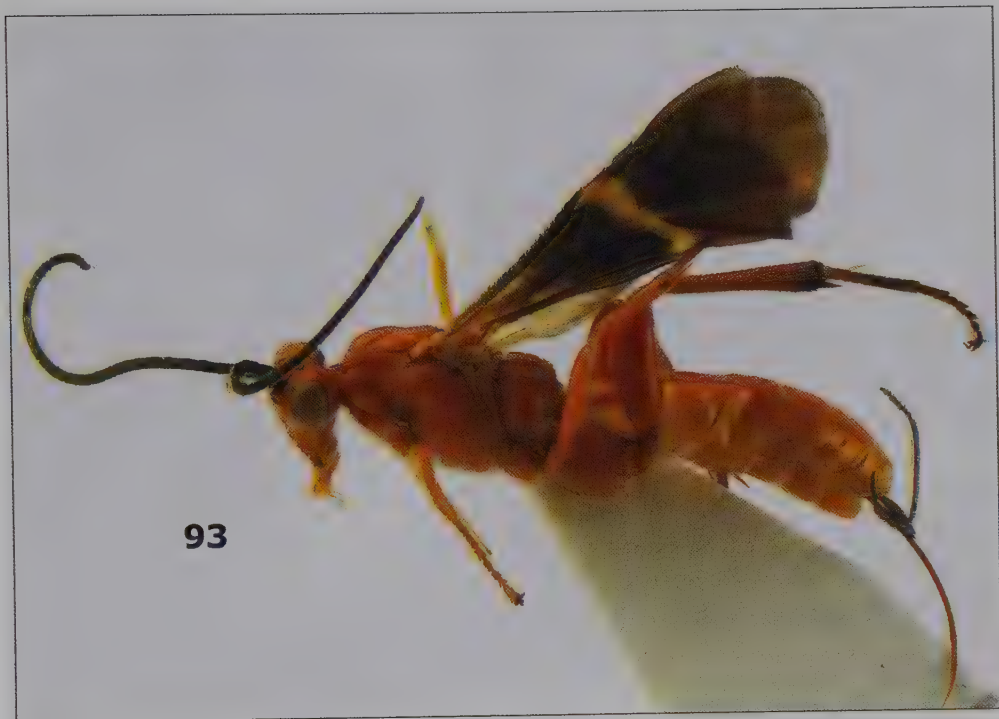


Plate 93. *Cremnops monochroa* Szépligeti, female, Yemen (NW of Manakhah), habitus, lateral aspect.

Genus *Disophrys* Foerster, 1862

Note: Two species of the genus *Disophrys* Foerster has been found on the Arab Peninsula. The species from UAE is very similar to the common species of this genus in Southeast Europe and the Mediterranean region: *D. initiator* (Fonscolombe, 1846) (= *D. inculcator* /*inculcatrix* auctt., not Linnaeus, 1758). *Cremnops rubrigaster* Masi, 1944, from Somalia may belong here, but it has the head and the mesosoma black.

Key to Arab species of the genus *Disophrys* Foerster

- 1 Hind coxa large smooth and shiny dorsally; face with spaced punctures and with smooth interspaces (Plate 108); mouthparts (including palpi), stemmaticum and head medio-dorsally dark brown or black (Plates 108, 109); first metasomal tergite distinctly widened apically (Plate 105); pterostigma dark brown (Plate 106); antenna with 38–43 segments; UAE *D. angitemporalis* nov. spec.
- Hind coxa densely punctate-reticulate and rather dull dorsally; face densely and coarsely punctate, without distinct smooth interspaces (Plate 117); mouthparts (including palpi), stemmaticum and head medio-dorsally brownish-yellow (Plates 117, 118); first tergite parallel-sided apically or nearly so (Plate 114); pterostigma yellow, at most apically darkened (Plate 115); antenna with 52–56 segments; Yemen *D. punctifera* nov. spec.



Plates 94–101. *Cremnops monochroa* Szépligeti, female, Yemen (NW of Manakhah). 94: Mesosoma, lateral aspect; 95: Mesosoma, dorsal aspect; 96: First–third metasomal tergites, dorsal aspect; 97: Wings; 98: Hind leg, lateral aspect; 99: Head, dorsal aspect; 100: Head, anterior aspect; 101: Head, lateral aspect.

Disophrys angitemporalis* van Achterberg **nov. spec.*

Plates 102–110

Specimens examined: Holotype, ♀ (RMNH), “United Arab Emirates, Sharjah Desert Park, 25°17'N, 55°42'E, 19–22.iii.2008 (9156), hand net, K. Mahmood, RMNH'08”. Paratypes (7♂+2♀): 4♂, 1♀, same data as holotype; 2♂, 1♀, same data but 26.viii.2008. 1♂ (Schmid-Egger coll.), 10 km SW of Ra's al-Khaimah Airport, 25°56'N, 55°88'E, 11–19.iii.2009, leg. C. Schmid-Egger.

Diagnosis: The new species is close to the SW Palaearctic *D. initiator* (Fonscolombe, 1846), but differs by having the eye of the female in dorsal view 3–4 times (1.5–2.4 times in *D. initiator*) as long as the temple (males of both species 1.7–2.4 times), the fore femur inflated (slender), the scapus of female largely blackish with reddish patch (completely black), the scapus of the male largely yellowish-brown and dorsally partly black (black).

Description: Female, holotype, length of fore wing 7.5 mm and of body 9.5 mm. Head. Antennal segments 41, length of third segment 1.8 times fourth segment, length of third, fourth and penultimate segments 2.8, 1.6 and 1.2 times their width, respectively; apical antennal segment 1.6 times as long as penultimate segment; length of maxillary palp 0.6 times height of head; in dorsal view eye 3.0 times as long as temple (Plate 110); POL:OD:OOL = 20:10:27; between antennal sockets with two lobes; occipital flange large, its ventral margin round (Plate 109); face laterally sparsely finely punctate and medially densely coarsely punctate; clypeus strongly convex, medially sparsely finely punctate and laterally densely coarsely punctate; frons rugose medially, with pair of rugae connected to lobes as weak as other rugae and sublateral carinae strong; vertex flat and sparsely finely punctate; length of malar space 2.7 times as long as basal width of mandible and eye 1.2 times as high as malar space; galea as long as malar space. Mesosoma. Length of mesosoma 1.4 times its height; subpronope large and deep; side of pronotum smooth medially, sparsely finely punctate laterally and crenulate postero-ventrally; area near lateral carina of mesoscutum with some crenulae; mesoscutum sparsely punctate and punctures with setae; notauli deep and finely crenulate (Plate 104); scutellar sulcus 0.8 times as long as dorsal face of scutellum and with 3 carinae; scutellum sparsely finely punctate, slightly convex and rounded anteriorly; mesopleuron above precoxal sulcus sparsely finely punctate, below precoxal sulcus coarsely punctate and with interspaces wider than punctures; precoxal sulcus wide and with long crenulae (Plate 103); metapleuron coarsely punctate and with interspaces wider than punctures dorsally and rugose ventrally; propodeum rugose and distinctly areolate, spiracle rather large and elliptical, removed from lateral carina. Wings. Fore wing: second submarginal cell slightly pentagonal, wide anteriorly, with short ramellus, slightly angled at ramellus (Plate 106); r:3-SR:SR1 = 5:8:55; 2-SR:3-SR:r-m = 8:8:9; vein cu-a interstitial. Hind wing: with 5 hamuli; vein M+CU 1.7 times as long as vein 1-M; surroundings of cu-a sparsely setose. Legs. Length of hind femur, tibia and basitarsus 3.2, 6.0 and 5.4 times their width, respectively; hind coxa largely smooth dorsally; hind femur coarsely and densely punctate, hind tibia coarsely rugose; outer side middle and hind tibiae without pegs; length of outer and inner spurs of middle tibia 0.5 and 0.6 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.4 and 0.5 times hind basitarsus, respectively; fore femur inflated, 2.7 times as long as its maximum width. Metasoma. First tergite widened apically and 1.7 times as long as its apical width (Plate 105), smooth as second tergite; dorsal carinae of first tergite absent; second tergite 0.9 times as long as third tergite and without transverse depression; second metasomal suture narrow; metasoma nearly completely glabrous; ovipositor sheath moderately slender and dorsally largely glabrous; ovipositor 0.06 times as long as fore wing.

Colour. Yellowish-brown; antenna black, except inner side of scapus; labrum ventrally, palpi, galea, hind tarsus, hind tibial spurs and ovipositor sheath (except subapical patch) dark



Plate 102. *Disophrys angitemporalis* van Achterberg nov. spec., female, holotype, UAE (Sharjah Desert Park), habitus, lateral aspect.

brown; wings dark brown, except for narrow subhyaline area below pterostigma; pterostigma and parastigma dark brown.

Variation. Antennal segments of female 38 (1) or 41 (1), of male 40 (1), 41 (1), 42 (2) or 43 (2); length of fore wing of female 6.1–7.5 mm (of male 6.5–6.9 mm); length of body of female 7.4–9.5 mm (of male 7.3–8.9 mm); length of first metasomal tergite 1.3–1.7 times its apical width; mesosoma varies from black with pronotum and mesonotum yellowish-brown to completely yellowish-brown except dark brown propleuron.

Biology: Unknown; other species have been reared from Noctuid caterpillars.

Distribution: United Arab Emirates.

Etymology: The name “*angitemporalis*” refers to the narrow (“angustus” in Latin) temple (“tempora” in Latin is plural for “time”, pertaining to life or time and also used for the flat part at the side of the head).



Plates 103–110. *Disophrys angitemporalis* van Achterberg nov. spec., female, holotype, UAE (Sharjah Desert Park). 103: Mesosoma, lateral aspect; 104: Mesosoma, dorsal aspect; 105: First-third metasomal tergites, dorsal aspect; 106: Wings; 107: Hind leg, lateral aspect; 108: Head, anterior aspect; 109: Head, lateral aspect; 110: Head, dorsal aspect.

***Disophrys punctifera* van Achterberg nov. spec.**

Plates 111–120

Specimens examined: Holotype: ♀ (RMNH), “Yemen (5962), 12 km NW Manakhah, Mal[aise] tr[ap], 3.vii–21.viii.2001, A. v. Harten, RMNH’02”. Paratypes (1♂+4♀): 1♂, same data as holotype but 15.ix–22.x.2003; 2♀, same but 15.ix–22.x.2003; 1♀, same but 6.vii–21.viii.2003. 1♀, Ta’izz, viii.1999, LT, AvH & A. Awad.

Diagnosis: The new species is similar to the SW Palaearctic *D. initiator* (Fonscolombe, 1846), but differs by having the galea brownish-yellow (dark brown in *D. initiator*), the mesoscutum and scutellum coarsely punctate (smooth), the first metasomal tergite more elongate (Plate 114; less elongate), the pterostigma yellow (dark brown) and the area below the precoxal sulcus densely and coarsely punctate (sparsely and finely punctate).

Description: Female, holotype, length of fore wing 8.1 mm and of body 8.0 mm. Head. Antennal segments 55, length of third segment 1.6 times fourth segment, length of third, fourth and penultimate segments 2.5, 1.6 and 1.5 times their width, respectively; apical antennal segment 1.3 times as long as penultimate segment; length of maxillary palp 0.6 times height of head; in dorsal view eye 4.1 times as long as temple (Plate 119); POL:OD:OOL = 8:10:25; between antennal sockets with two lobes; occipital flange narrow, its ventral margin straight (Plate 118); face densely and coarsely punctate and medially reticulate–punctate, without distinct smooth interspaces; clypeus convex, protuberant medio-ventrally, punctate and with distinct smooth interspaces; frons largely smooth medially, with pair of weak rugae connected to lobes and sublateral carinae strong; vertex flat and sparsely coarsely punctate; length of malar space 2.1 times as long as basal width of mandible and eye 1.8 times as high as malar space; galea 0.9 times as long as malar space. Mesosoma. Length of mesosoma 1.5 times its height; subpronope large and deep; side of pronotum smooth medially, rather densely punctate dorsally and crenulate posteriorly; area near lateral carina of mesoscutum with some crenulae; mesoscutum coarsely punctate and interspaces about equal to diameter of punctures; notauli shallow and smooth (Plate 113); scutellar sulcus 0.8 times as long as dorsal face of scutellum and with 1 long and 2 short carinae; scutellum sparsely punctate, slightly convex and rounded anteriorly; mesosternal sulcus shallow and largely smooth; propleuron and mesopleuron below precoxal sulcus densely and coarsely punctate, above precoxal sulcus moderately punctate and with interspaces about as wide as punctures; precoxal sulcus moderately wide and with medium-sized crenulae (Plate 112); metapleuron coarsely punctate and with interspaces narrower than punctures; propodeum distinctly reticulate–areolate, spiracle large and elliptical, removed from lamelliform lateral carina. Wings. Fore wing: second submarginal cell slightly pentagonal, wide anteriorly, with short ramellus, slightly angled at ramellus (Plate 115); $r:3\text{-SR}:SR1 = 10:11:81$; $2\text{-SR}:3\text{-SR}:r\text{-m} = 11:11:8$; vein cu-a interstitial. Hind wing: with 4 hamuli; vein M+CU 1.3 times as long as vein 1-M; surroundings of cu-a sparsely setose. Legs. Length of hind femur, tibia and basitarsus 3.6, 6.1 and 7.4 times their width, respectively; hind coxa coarsely punctate–reticulate dorsally, hind femur coarsely and densely punctate, hind tibia coarsely irregularly rugose; outer side middle and hind tibiae without pegs; length of outer and inner spurs of middle tibia 0.6 and 0.7 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.35 and 0.50 times hind basitarsus, respectively; fore femur rather inflated, 3.5 times as long as its maximum width. Metasoma. First tergite parallel-sided apically and 2.8 times as long as its apical width (Plate 114), smooth as second tergite; dorsal carinae of first tergite absent; second tergite 1.1 times as long as third tergite and without transverse depression, but antero-laterally depressed; second metasomal suture absent; metasoma nearly largely glabrous, except for apical row of setae; ovipositor sheath moderately slender and dorso-basally glabrous; ovipositor 0.03 times as long as fore wing.



Plate 111. *Disophrys punctigera* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah), habitus, lateral aspect.

Colour. Yellowish-brown; antenna black, but inner and dorsal side of scapus largely reddish-brown; ovipositor sheath brown, but darkened basally; labrum, palpi, galea, tegulae, fore and middle legs and metasoma (except first and second tergites) brownish-yellow; wings dark brown, except for narrow subhyaline area below pterostigma; veins and parastigma dark brown and pterostigma yellow, but slightly darkened apically.

Variation. Antennal segments of female 52 (1), 54 (1), 55 (2) or 56 (1), of male 53 (1); length of fore wing of female 7.4–9.0 mm (of male 7.5 mm); length of body of female 8.0–11.5 mm (of male 8.4 mm); length of first metasomal tergite 2.3–2.9 times its apical width.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name “*punctigera*” refers to the punctate (“punctum” in Latin means small hole or dot and “fera” in Latin is a suffix meaning carrying or having) mesoscutum and mesopleuron.

Genus *Lytopylus* Foerster, 1862

Note: Only one species of the genus *Lytopylus* Foerster has been found in the Arabian Peninsula.

***Lytopylus brevitarsis* van Achterberg nov. spec.**

Specimens examined: Holotype: ♀ (RMNH), “Yemen (5962), 12 km NW Manakhah, Mal[aise] tr[ap], 3.vii–21.viii.2001, A. v. Harten, RMNH’02”. Paratype: 1♂, same as holotype but 15.ix–22.x.2003.

Diagnosis: The new species is close to *L. melleus* (Brues, 1926) from South Africa, but differs by having the second–fifth fore tarsal segments comparatively short (Plate 130; slender in *L. melleus*), the head rather narrowed ventrally (less so in *L. melleus*), between

Plates 121–130



Plates 112–120. *Disophrys punctigera* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah). 112: Mesosoma, lateral aspect; 113: Mesosoma, dorsal aspect; 114: First–third metasomal tergites, dorsal aspect; 115: Wings; 116: Hind leg, lateral aspect; 117: Head, anterior aspect; 118: Head, lateral aspect; 119: Head, dorsal aspect; 120: Fore and middle tarsi, lateral aspect.

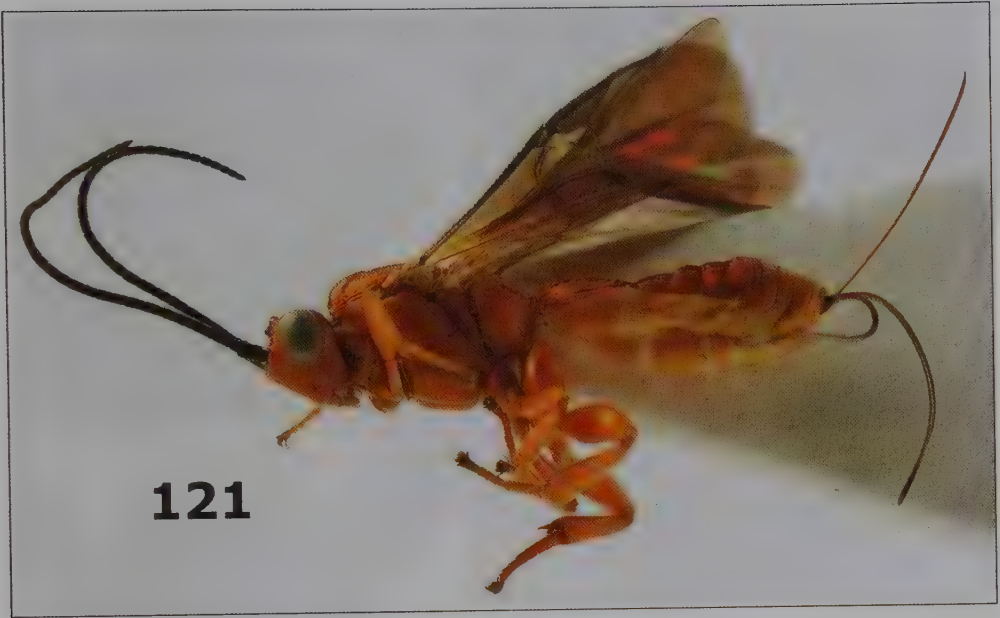


Plate 121. *Lytopylus brevitorsis* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah), habitus, lateral aspect.

antennal sockets pair of carinae (without carinae) and the middle tibia without cluster of pegs above apical cluster (with cluster of pegs), posterior part of the second tergite comparatively short compared to its anterior part (comparatively long), posterior part of thirds tergite striate basally (without striae), notauli absent posteriorly (narrowly developed), precoxal sulcus smooth (crenulate) and the ovipositor sheath about as long as the metasoma (about 1.5 times). Description: Female, holotype, length of fore wing 3.7 mm and of body 4.7 mm. Head. Antennal segments 33; length of third segment 1.4 times fourth segment, length of third, fourth and penultimate segments 3.0, 2.1 and 1.3 times their width, respectively; apical antennal segment 1.4 times as long as penultimate segment; length of maxillary palp 0.5 times height of head; in dorsal view length of eye 4.2 times temple (Plate 129); POL:OD:OOL = 10:5:13; antennal sockets slightly tubular; occipital flange narrow; face evenly setose and mainly smooth; frons smooth, with strong crest between antennal sockets, flat in front of anterior ocellus and deeply impressed behind antennal sockets; vertex smooth, sparsely setose; malar space 2.3 times as long as basal width of mandible and eye in lateral view 1.7 times as long as malar space. Mesosoma. Length of mesosoma 1.4 times its height; subpronope deep; side of pronotum smooth, but punctulate dorsally and crenulate posteriorly; area near lateral carina of mesoscutum smooth, but crenulate near tegulum; mesoscutum largely smooth with sparse setae and medium-sized punctures and with wide median groove on middle lobe; anterior half of notauli deep and smooth (Plate 123) and remainder absent; scutellar sulcus short, 0.3 times as long as dorsal face of scutellum and without carina; scutellum smooth, convex; mesopleuron shiny and largely smooth, except for sparse fine punctures; pleural sulcus crenulate; mesosternal sulcus smooth; precoxal sulcus absent except for wide smooth groove posteriorly (Plate 122); metapleuron largely smooth and sparsely



Plates 122–130. *Lytopylus brevitorsis* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah). 122: Mesosoma, lateral aspect; 123: Mesosoma, dorsal aspect; 124: First-third metasomal tergites, dorsal aspect; 125: Wings; 126: middle and hind legs, lateral aspect; 127: Head, anterior aspect; 128: Head, lateral aspect; 129: Head, dorsal aspect; 130: Fore tarsus, dorsal aspect.

punctate, but ventrally punctate-rugose; propodeum coarsely reticulate-rugose, with a submedial transverse carina and median carina, without areola, spiracle small, circular; lateral carina of propodeum wide lamelliform medially and posteriorly, absent anteriorly. Wings. Fore wing: second submarginal cell triangular and anteriorly petiolate (Plate 125); $r:SR1:1-R1:2-R1 = 3:55:25:20$; $2-SR:petiolus:r-m = 10:4:9$; vein cu-a postfurcal, inclivous. Hind wing: $2-SR+M$ longitudinal; $M+CU:1-M = 10:13$; surroundings of cu-a setose. Legs. Length of hind femur, tibia and basitarsus 3.0, 5.3 and 7.0 times their width, respectively; hind femur (as remainder of legs) with short and dense setosity; outer side of middle tibia without pegs except for a cluster of 3 pegs at apex; outer side of apex of hind tibia with a cluster of 9 pegs; length of outer and inner spurs of middle tibia 0.5 and 0.6 times middle basitarsus, respectively; length of outer and inner spurs of hind tibia 0.40 and 0.45 times hind basitarsus, respectively; second–fifth fore tarsal segments comparatively short (Plate 130). Metasoma. First tergite gradually widened apically, 1.1 times as long as its apical width (Plate 124), lamelliform laterally; coarsely longitudinally striate but medio-basally smooth and dorsal carinae of first tergite strong; second and third tergites coarsely longitudinally striate, but third tergite posteriorly finely coriaceous; second tergite about as long as third tergite, both tergites with deep striate transverse groove as second metasomal suture; remainder of metasoma smooth with sparse setae apically; ovipositor sheath 0.56 times as long as fore wing.

Colour. Yellowish-brown; antenna and ovipositor sheath black; labrum, fore and middle legs, palpi, tegulae and metasoma ventrally pale yellow; wings brown, except small pale parts below pterostigma (Plate 125); parastigma and pterostigma dark brown; hind tarsus yellowish-brown.

Variation. Male with 36 antennal segments; length of fore wing 4.2 mm and of body 5.0 mm; propodeum mainly areolate and interspaces largely smooth; middle lobe of mesoscutum protuberant; mesoscutum distinctly depressed medio-posteriorly; hind tarsus largely dark brown.

Biology: Unknown. One species has been reared from Tortricidae caterpillars.

Distribution: Yemen.

Etymology: The name “*brevitarsis*” refers to the short (“*brevis*” in Latin) fore tarsus (“*tarsos*” is Greek for ankle or flat part of the foot).

Genus *Therophilus* Wesmael, 1837

Note. Of the nearly cosmopolitan genus *Therophilus* Wesmael (not known from the Neotropical region) four species have been found in the Arabian Peninsula and only in Yemen. Probably several species occur in UAE and other Arab countries. The Arab species are similar to the Mediterranean *T. barbieri* (Simbolotti & van Achterberg, 1992) **nov. comb.**, but have the second metasomal tergite smooth and the marginal cell of the fore wing narrow anteriorly.

Key to Arab species of the genus *Therophilus* Wesmael

- 1 Ovipositor sheath about 0.45 times as long as fore wing and 1.3 times as long as hind tibia; middle lobe of mesoscutum with a short longitudinal groove medio-posteriorly (Plate 160); first metasomal tergite strongly widened apically and densely striate (Plate 161); second submarginal cell of fore wing long petiolate (Plate 162); antenna of female with 28 segments; Yemen *T. sulciferus* nov. spec.
- Ovipositor sheath 0.65–1.0 times as long as fore wing and 2.1–3.5 times as long as hind tibia; middle lobe of mesoscutum without longitudinal groove medio-posteriorly (Plates

- 133, 142, 151); first tergite gradually widened apically and usually less densely striate (Plates 134, 143, 152)); second submarginal cell of fore wing moderately petiolate (Plates 135, 144, 153); antenna of female with 22–26 segments **2**
- 2** Head and mesosoma black; antenna of female with about 22 segments; hind femur dark brown; propodeum mainly densely sculptured and with weakly developed areolae; prepectal carina narrow; Yemen *T. nigrator* nov. spec.
- Head at most medio-dorsally dark brown and mesosoma brownish-yellow; antenna of female with 24–26 segments; hind femur yellow; propodeum less densely sculptured and with distinctly developed areolae; prepectal carina wide lamelliform **3**
- 3** Head medio-dorsally dark brown; mesoscutum comparatively short (Plate 133); second metasomal suture narrow (Plate 134); Yemen *T. breviscutum* nov. spec.
- Head medio-dorsally brownish-yellow; mesoscutum comparatively elongate (Plate 142); second metasomal suture comparatively wide (Plate 143); Yemen *T. longiscutum* nov. spec.

***Therophilus breviscutum* van Achterberg nov. spec.**

Plates 131–139

Specimens examined: Holotype: ♀ (RMNH), “Yemen (8100), 12 km NW Manakhah, Mal[aise] tr[ap], 15.ix.–22.x.2003, A. v. Harten, RMNH’03”.

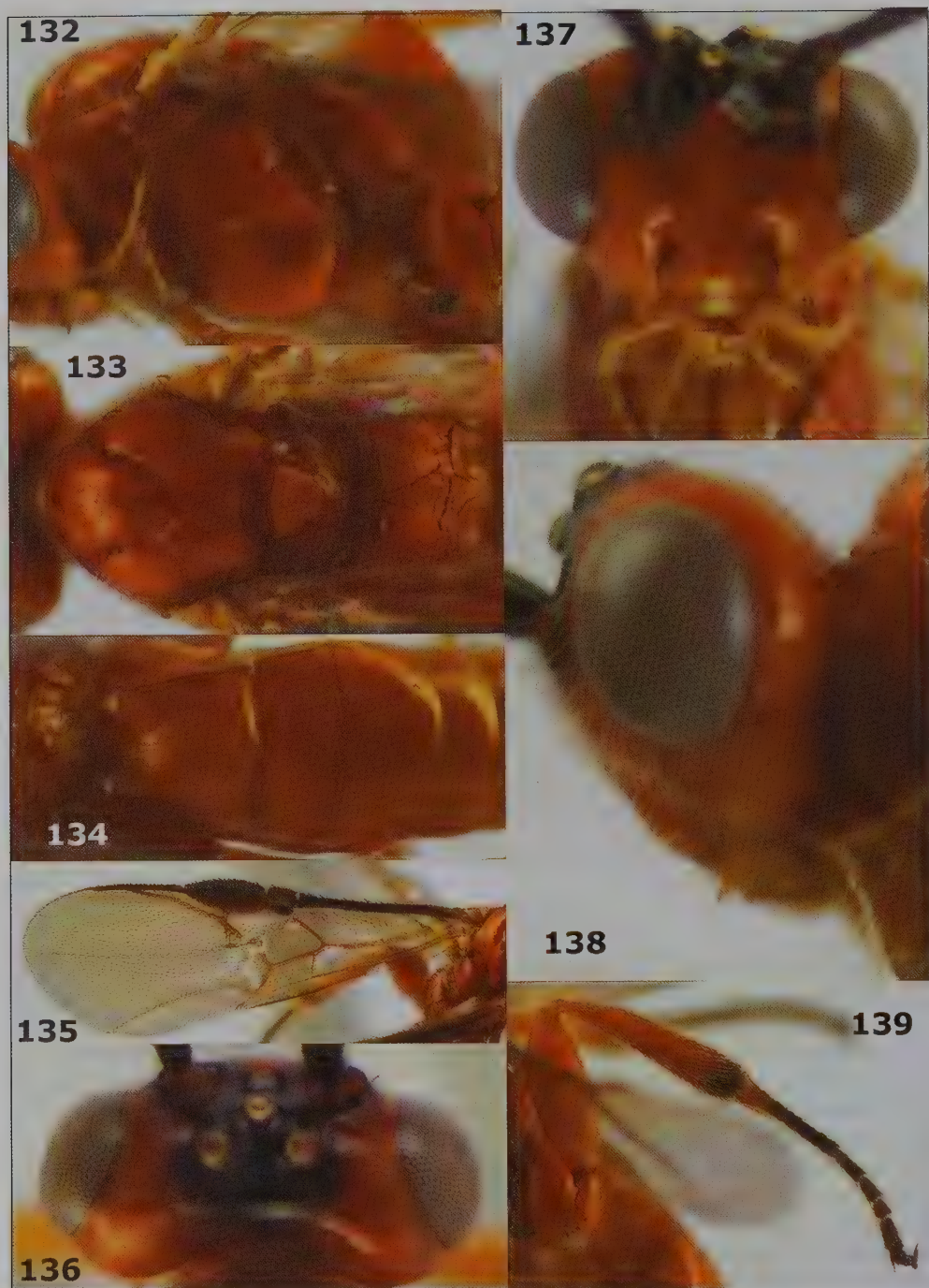
Diagnosis: The new species has the antenna of female with about 24 segments, the head medio-dorsally dark brown and remainder as the mesosoma brownish-yellow, the mesoscutum short (Plate 133), the middle lobe of the mesoscutum without a longitudinal groove medio-posteriorly, prepectal carina wide lamelliform, the propodeum less densely sculptured and with distinctly developed areolae, the second submarginal cell of fore wing moderately petiolate (Plate 135), the hind femur yellow, the first metasomal tergite gradually widened apically and comparatively sparsely striate (Plate 134), the second metasomal suture narrow and the ovipositor sheath 1.3–1.6 times as long as the metasoma. It is similar to *T. barbieri* Simbolotti & van Achterberg, 1992, from the West Mediterranean region, but the new species has the first metasomal tergite yellowish-brown (black in *T. barbieri*), the marginal cell of the fore wing narrow anteriorly (widened anteriorly), the ovipositor sheath distinctly shorter than the fore wing (about as long) and the second metasomal tergite and suture smooth (rugulose).

Description: Female, holotype, length of fore wing 2.6 mm and of body 3.2 mm. Head. Antennal segments 24 (without indistinct divisions halfway, apical segments rather moniliform and antenna 0.8 times as long as body), third segment mat, length of third segment 1.5 times fourth segment, length of third, fourth and penultimate segments 3.5, 2.3 and 1.3 times their width, respectively; apical antennal segment 1.4 times as long as penultimate segment; length of maxillary palp 0.6 times height of head; in dorsal view eye 3.4 times as long as temple (Plate 136); POL:OD:OOL = 11:5:7; between antennal sockets with a triangular area; occipital flange narrow; face evenly weakly convex and smooth, with dense setosity; clypeus flattened and concave medio-ventrally and smooth; frons smooth, area above antennal socket distinctly depressed and up to stemmaticum, without median ridge and triangular area in front of anterior ocellus wide, large and shallow; vertex weakly convex and smooth except for some fine punctures; length of malar space 2.4 times as long as basal width of mandible and eye 2.1 times as high as malar space; galea 0.4 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.4 times its height; side of pronotum smooth, but crenulate and with few punctures posteriorly; area near lateral carina of mesoscutum crenulate; mesoscutum shiny and sparsely punctulate, moderately convex, comparatively short (Plate 133) and medio-posteriorly flat and smooth; notauli nearly



Plate 131. *Therophilus breviscutum* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah), habitus, lateral aspect.

complete (forming a nearly complete curve), distinctly impressed and finely crenulate (Plate 133); scutellar sulcus 0.5 times as long as dorsal face of scutellum and with 1 long crenula; scutellum sparsely punctulate and slightly convex; prepectal carina wide lamelliform; precoxal sulcus rather narrow, crenulate and only posterior third present (Plate 132); epicnemial area smooth, except for some punctulation, remainder of mesopleuron shiny and nearly entirely smooth; mesosternal suture narrow, shallow and smooth; metapleuron with rather dense setosity and smooth except for some spaced punctures medially and some rugae ventrally; propodeum areolate and interspaces largely reticulate-rugose, but posteriorly largely smooth, shiny, its spiracle small and round, lateral carina indistinct. Wings. Fore wing: 2-R1 0.6 times as long as 1-R1; 1-R1 0.7 times as long as pterostigma; pterostigma semi-oval; marginal cell subparallel-sided and narrow (Plate 135); $r:SR1:2-SR = 2:36:5$; second submarginal cell small and petiolate, petiolus as long as 2-SR; cu-a distinctly postfurcal; basal half of wing with less dense setosity than apical half. Hind wing with 3 hamuli; vein M+CU 1.1 times as long as vein 1-M; surroundings of cu-a setose. Legs. Length of hind femur, tibia and basitarsus 2.6, 4.8 and 9.0 times their width, respectively; hind femur



Plates 132–139. *Therophilus breviscutum* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah). 132: Mesosoma, lateral aspect; 133: Mesosoma, dorsal aspect; 134: First-third metasomal tergites, dorsal aspect; 135: Fore wing; 136: Head, dorsal aspect; 137: Head, anterior aspect; 138: Head, lateral aspect; 139: Hind leg, lateral aspect.

largely smooth and shiny; outer side of middle and hind tibiae with 2 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.5 times middle basitarsus; length of outer and inner spurs of hind tibia 0.4 and 0.5 times hind basitarsus; fore femur and tarsus moderately slender; tarsal claws with medium-sized acute lobe. Metasoma. First tergite moderately widened apically, slightly constricted behind spiracles and as long as its apical width (Plate 134), shiny and longitudinally striate but posteriorly mainly smooth except for some punctures, dorsal carinae present laterally except apically; second tergite smooth, with slightly differentiated wide elliptical basal area and posteriorly with obsolescent transverse depression; second tergite 0.8 times as long as third tergite, transverse and hardly widened posteriorly (Plate 134); second metasomal suture distinct; metasoma largely glabrous, tergites at most with apical row of setae; ovipositor sheath slender (and narrowed apically) and with medium-sized setae; ovipositor sheath 0.85 times as long as fore wing, 1.4 times as long as metasoma and 2.9 times as long as hind tibia.

Colour. Yellowish-brown; antenna, antennal sockets, frons medially, stemmaticum, vertex and occiput medially, middle telotarsus, apex of hind tibia, hind tarsus, veins of fore wing anteriorly, pterostigma and ovipositor sheath dark brown; palpi, clypeus, labrum, tegulae and fore and middle legs pale yellow; wings weakly infusate; remainder of wing veins brown.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name “*breviscutum*” refers to the comparatively short (“*brevis*” in Latin) mesoscutum (“*scutum*” in Latin means shield).

Therophilus longiscutum* van Achterberg *nov. spec.

Plates 140–148

Specimens examined: Holotype: ♀ (RMNH), “Yemen (8100), 12 km NW Manakhah, Mal[aise] trap, 4.viii.–15.ix.2003, A. v. Harten, RMNH’03”. Paratype: 1♂ (RMNH), topotypic, but 24.vi–4.viii.2003.

Diagnosis: The new species has the antenna of female with about 26 segments, the head medio-dorsally brownish-yellow, the mesoscutum comparatively elongate (Plate 142), the middle lobe of mesoscutum without a longitudinal groove medio-posteriorly, the prepectal carina wide lamelliform, the propodeum less densely sculptured and with distinctly developed areolae, the second submarginal cell of fore wing moderately petiolate (Plate 144), the hind femur yellow, the first metasomal tergite gradually widened apically and comparatively sparsely striate (Plate 143), the second metasomal suture wide (Plate 143) and the ovipositor sheath about 1.7 times as long as the metasoma. It is similar to *T. barbieri* Simbolotti & van Achterberg, 1992, from the West Mediterranean region, but the new species has the first metasomal tergite yellowish-brown (black in *T. barbieri*), the marginal cell of the fore wing narrow anteriorly (widened anteriorly), the ovipositor sheath distinctly shorter than the fore wing (about as long) and the second metasomal tergite and suture smooth (rugulose).

Description: Female, holotype, length of fore wing 4.0 mm and of body 4.4 mm. Head. Antennal segments 26 (with indistinct divisions halfway, apical segments not moniliform and antenna 0.8 times as long as body), third segment mat, length of third segment 1.3 times fourth segment, length of third, fourth and penultimate segments 3.4, 2.6 and 1.5 times their width, respectively; apical antennal segment 1.4 times as long as penultimate segment; length of maxillary palp 0.7 times height of head; in dorsal view eye 2.7 times as long as temple (Plate 148); POL:OD:OOL = 10:5:8; between antennal sockets with a triangular area; occipital flange narrow; face evenly weakly convex and smooth but finely punctate dorsally, with dense setosity; clypeus flattened and slightly concave medio-ventrally and smooth; frons smooth, area above antennal socket distinctly depressed and up to stemmaticum, without median ridge and area in front of anterior ocellus wide, transverse and shallow; vertex nearly

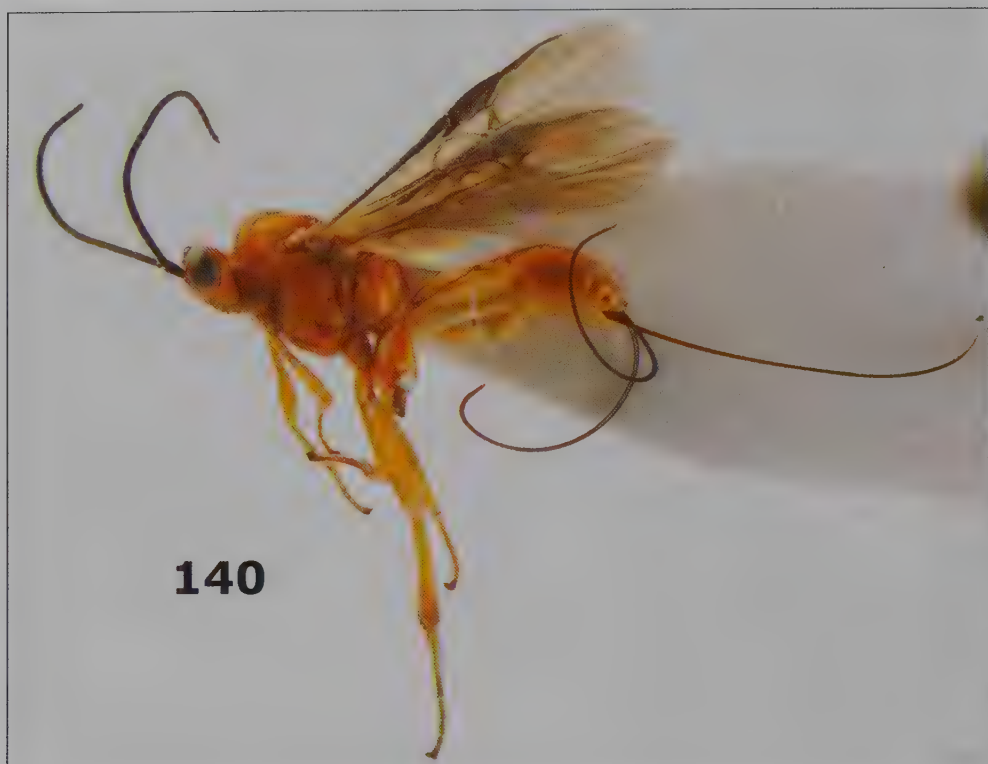


Plate 140. *Therophilus longiscutum* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah), habitus, lateral aspect.

flat and smooth except for some fine punctures; length of malar space 2.6 times as long as basal width of mandible and eye 1.8 times as high as malar space; galea 0.4 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.4 times its height; side of pronotum smooth, but crenulate posteriorly and finely punctate dorso-posteriorly; area near lateral carina of mesoscutum indistinctly crenulate; mesoscutum shiny and sparsely punctulate, moderately convex, moderately long (Plate 142) and medio-posteriorly flat and smooth; notauli nearly complete (not forming a curve), distinctly impressed and finely crenulate (Plate 142); scutellar sulcus 0.5 times as long as dorsal face of scutellum and with 4 long crenulae; scutellum sparsely punctulate and slightly convex; prepectal carina wide lamelliform; precoxal sulcus rather narrow, crenulate and only posterior 0.4 present (Plate 141); epicnemial area smooth, except for some punctulation, remainder of mesopleuron shiny and nearly entirely smooth with some punctulation; mesosternal suture narrow, shallow and smooth; metapleuron with rather dense setosity and spaced punctate dorsally and reticulate-rugose ventrally; propodeum areolate and interspaces superficially rugose, but latero-posteriorly largely smooth, shiny, its spiracle small and round, lateral carina lamelliform. Wings. Fore wing: 2-R1 0.9 times as long as 1-R1; 1-R1 0.5 times as long as pterostigma; pterostigma semi-oval; marginal cell subparallel-sided and narrow, SR1 curved towards pterostigma (Plate 144); r:SR1:2-SR = 2:36:7; second submarginal cell small and petiolate,



Plates 141–148. *Therophilus longiscutum* van Achterberg nov. spec., female, holotype, Yemen (NW of Manakhah). 141: Mesosoma, lateral aspect; 142: Mesosoma, dorsal aspect; 143: First-third metasomal tergites, dorsal aspect; 144: Wings; 145: Hind leg, lateral aspect; 146: Head, anterior aspect; 147: Head, lateral aspect; 148: Head, dorsal aspect.

petiolus 0.7 times as long as 2-SR; cu-a distinctly postfurcal; basal half of wing regularly setose but with less dense setosity than apical half. Hind wing: with 3 hamuli; vein M+CU 1.3 times as long as vein 1-M; surroundings of cu-a with sparse setosity. Legs. Length of hind femur, tibia and basitarsus 2.9, 5.2 and 10.4 times their width, respectively; hind femur largely smooth and shiny; outer side of middle and hind tibiae with 3 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.6 times middle basitarsus; length of outer and inner spurs of hind tibia 0.35 and 0.5 times hind basitarsus; fore femur moderately slender and tarsus slender; tarsal claws with large acute lobe. Metasoma. First tergite distinctly widened apically, slightly constricted behind spiracles and 0.8 times as long as its apical width (Plate 143), shiny and longitudinally striate but posteriorly mainly smooth except for some punctures, dorsal carinae present laterally except apically; second tergite smooth, with slightly differentiated wide elliptical basal area and posteriorly with obsolescent transverse depression; second tergite 0.8 times as long as third tergite, transverse and hardly widened posteriorly (Plate 143); second metasomal suture distinctly impressed; metasoma largely glabrous, tergites at most with apical row of setae; ovipositor sheath slender (and narrowed apically) and with medium-sized setae; ovipositor sheath as long as fore wing, 1.7 times as long as metasoma and 3.5 times as long as hind tibia. Colour. Yellowish-brown; antenna, middle telotarsus, veins of fore wing anteriorly, parastigma, pterostigma and ovipositor sheath dark brown; apex of hind tibia slightly and hind tarsus (except basally) infusate; palpi, clypeus, labrum, tegulae and fore and middle legs, remainder of hind tibia and base of hind basitarsus and metasoma ventrally pale yellow; wings weakly infusate; remainder of wing veins brown.

Variation. Paratype male is very similar to holotype female; it has 26 antennal segments, length of fore wing 3.3 mm, and of body 4.4 mm, fifth and sixth metasomal tergites mainly dark brown; stemmaticum near ocelli slightly darkened and length of first metasomal tergite 0.8 times as long as its apical width.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name "*longiscutum*" refers to the comparatively long ("longus" in Latin) mesoscutum ("scutum" in Latin means shield).

***Therophilus nigrator* van Achterberg nov. spec.**

Plates 149–157

Specimens examined: Holotype: ♀ (RMNH), "Yemen (no. 3285), Ta'izz, light trap, 22–24.viii.1998, A. v. Harten & Ahmad Ahwad, RMNH'99". Paratypes: 1♀, (RMNH), topotypic, but 26–28.vii.1999. 1♀ (RMNH), ar-Rujum, 9.iv–5.vi.2001, MT, AvH.

Diagnosis: The new species has the antenna of female with about 22 segments, the head and the mesosoma black, the prepectal carina narrow, the middle lobe of mesoscutum without a longitudinal groove medio-posteriorly, the propodeum mainly densely sculptured and with weakly developed areolae, the second submarginal cell of fore wing moderately petiolate (Plate 153), the hind femur dark brown, the first metasomal tergite gradually widened apically and comparatively sparsely striate (Plate 152), the ovipositor sheath about 1.3 times as long as the metasoma and about 0.65 times as long as the fore wing.

It is similar to *T. triangularis* (Szépligeti, 1914) **nov. comb.** from Tanzania, but the new species has the second metasomal tergite yellowish-brown and anteriorly smooth (black and anteriorly rather rugulose in *T. triangularis*), the precoxal sulcus long (short), the hind femur dark brown (yellow), the length of the body about 2.5 mm (about 4 mm) and the first metasomal tergite densely striate (rather coriaceous).

Description: Female, holotype, length of fore wing 2.1 mm and of body 2.4 mm. Head. Antennal segments 22 (without divisions halfway, apical segments not moniliform and



Plate 149. *Therophilus nigrator* van Achterberg nov. spec., female, holotype, Yemen (Ta'izz), habitus, lateral aspect.

antenna 0.7 times as long as body), third segment mat, length of third segment 1.3 times fourth segment, length of third, fourth and penultimate segments 4.0, 3.0 and 1.5 times their width, respectively; apical antennal segment 1.3 times as long as penultimate segment; length of maxillary palp 0.6 times height of head; in dorsal view eye 3.6 times as long as temple (Plate 154); POL:OD:OOL = 2:1:2; between antennal sockets with a triangular area; occipital flange narrow; face evenly weakly convex and smooth but finely punctulate, with dense setosity; clypeus flattened and slightly concave medio-ventrally and smooth; frons smooth, area above antennal socket distinctly depressed and up to stemmaticum, without median ridge and area in front of anterior ocellus flat; vertex slightly convex and smooth; length of malar space twice as long as basal width of mandible and eye 2.4 times as high as malar space; galea 0.5 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.4 times its height; side of pronotum smooth, but depressed and hardly crenulate posteriorly; area near lateral carina of mesoscutum indistinctly crenulate; mesoscutum shiny and sparsely punctulate, moderately convex, moderately long (Plate 151) and medio-posteriorly flat and smooth; notauli nearly complete (not forming a curve), distinctly impressed and finely crenulate (Plate 151); scutellar sulcus 0.4 times as long as dorsal face of scutellum and with 3 long crenulae; scutellum sparsely punctulate and slightly convex; prepectal carina narrow lamelliform; precoxal sulcus narrow, finely crenulate and posterior two thirds present (Plate 150); epinemial area smooth, except for some punctulation, remainder of mesopleuron shiny and nearly entirely smooth with some punctulation; mesosternal suture narrow and distinctly



Plates 150–157. *Therophilus nigrator* van Achterberg nov. spec., female, holotype, Yemen (Ta'izz).
 150: Mesosoma, lateral aspect; 151: Mesosoma, dorsal aspect; 152: First-third metasomal tergites, dorsal aspect; 153: Wings; 154: Head, dorsal aspect; 155: Head, anterior aspect; 156: Head, lateral aspect; 157: Middle and hind legs, lateral aspect.

crenulate; metapleuron with rather dense setosity and smooth dorsally and reticulate-rugose ventrally; propodeum densely reticulate-rugose, but latero-posteriorly largely smooth, shiny, its spiracle small and round, lateral carina narrow and not lamelliform. Wings. Fore wing: 2-R1 1.7 times as long as 1-R1; 1-R1 0.4 times as long as pterostigma; pterostigma semi-oval; marginal cell widened anteriorly and narrow, SR1 curved towards pterostigma (Plate 153); $r:SR1:2-SR = 2:34:4$; second submarginal cell small and petiolate, petiolus as long as 2-SR; cu-adistinctly postfurcal; basal half of wing regularly setose but with somewhat less dense setosity than apical half. Hind wing: with 3 hamuli; vein M+CU 1.6 times as long as vein 1-M; surroundings of cu-a with sparse setosity. Legs. Length of hind femur, tibia and basitarsus 3.1, 5.4 and 7.0 times their width, respectively; hind femur largely smooth and shiny; outer side of middle and hind tibiae with 2 and no pegs above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.5 times middle basitarsus; length of outer and inner spurs of hind tibia 0.4 and 0.5 times hind basitarsus; fore femur moderately slender and tarsus slender; tarsal claws with large acute lobe. Metasoma. First tergite distinctly widened apically, not constricted behind spiracles and 1.1 times as long as its apical width (Plate 152), shiny and nearly completely densely longitudinally striate, dorsal carinae present laterally, fine and absent apically; second tergite smooth, with slightly differentiated wide elliptical basal area and posteriorly with obsolescent transverse depression; second tergite 0.8 times as long as third tergite, transverse and somewhat widened posteriorly (Plate 152); second metasomal suture distinctly impressed, but narrow; metasoma largely glabrous, tergites at most with apical row of setae; ovipositor sheath slender (and widened apically) and with medium-sized setae; ovipositor sheath 0.69 times as long as fore wing, 1.3 times as long as metasoma and 2.1 times as long as hind tibia.

Colour. Black; antenna, fore and middle coxae and telotarsi, hind femur (except apically), hind tibia apically, hind tarsus (except basally), veins of fore wing anteriorly, parastigma, pterostigma, third and following tergites and ovipositor sheath dark brown; palpi, labrum, tegulae and remainder of fore and middle legs (but middle femur brownish), apex of first tergite narrowly, second tergite and metasoma baso-ventrally brownish-yellow; wings slightly infusate; remainder of wing veins brown.

Variation. Antenna of female with 21 (1) or 22 (1) segments, length of fore wing 2.1–2.2 mm, and of body 2.3–2.4 mm, mesoscutum flat or slightly impressed medio-posteriorly and length of ovipositor sheath 0.69–0.70 times as long as fore wing.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name "*nigrator*" refers to the mainly black ("*nigra*" in Latin) body.

Therophilus sulciferus* van Achterberg *nov. spec.

Plates 158–166

Specimens examined: Holotype: ♀ (RMNH), "Yemen (5556), Ar Rujum, 15.i.–9.iv.2001, Mal. trap, A. v. Harten, RMNH'02".

Diagnosis: The new species has the antenna of female with about 28 segments, the middle lobe of the mesoscutum with a short longitudinal groove medio-posteriorly, the second submarginal cell of fore wing long petiolate (Plate 162), the first metasomal tergite strongly widened apically and densely striate (Plate 161), the body completely yellowish-brown and the ovipositor sheath 0.8 times as long as the metasoma and about 0.45 times as long as the fore wing.

It is similar to *T. barbieri* Simbolotti & van Achterberg, 1992, from the West Mediterranean region, but the new species has the first metasomal tergite yellowish-brown (black in *T. barbieri*), the marginal cell of the fore wing narrow anteriorly (widened anteriorly) and the second metasomal tergite and suture smooth (rugulose).



Plate 158. *Therophilus sulciferus* van Achterberg nov. spec., female, holotype, Yemen (Ar-Rujum), habitus, lateral aspect.

Description: Female, holotype, length of fore wing 3.2 mm and of body 3.5 mm. Head. Antennal segments 28 (with indistinct divisions halfway, apical segments not moniliform and antenna 0.8 times as long as body), third segment mat, length of third segment 1.3 times fourth segment, length of third, fourth and penultimate segments 3.2, 2.4 and 1.5 times their width, respectively; apical antennal segment as long as penultimate segment; length of maxillary palp 0.7 times height of head; in dorsal view eye 7.0 times as long as temple (Plate 163); POL:OD:OOL = 12:7:9; between antennal sockets with a triangular area; occipital flange narrow lamelliform; face evenly weakly convex and smooth but finely punctate dorsally, with dense setosity; clypeus convex, but flattened ventrally and slightly concave medio-ventrally and smooth; frons smooth, area above antennal socket distinctly depressed and up to stemmaticum, without median ridge and area in front of anterior ocellus shallowly triangularly impressed; vertex slightly convex and smooth; length of malar space 3.4 times as long as basal width of mandible and eye 1.8 times as high as malar space; galea 0.6 times as long as malar space and apically obtuse. Mesosoma. Length of mesosoma 1.3 times its height; side of pronotum smooth, but medial and posterior grooves completely crenulate and finely punctate dorso-posteriorly; area near lateral carina of mesoscutum crenulate; mesoscutum shiny and sparsely punctulate, moderately convex, moderately long (Plate 160) and medio-posteriorly flat and punctate; notauli complete, not forming a curve and posteriorly enclosing



Plates 159–166. *Therophilus nigrator* van Achterberg nov. spec., female, holotype, Yemen (Ta'izz). 159: Mesosoma, lateral aspect; 160: Mesosoma, dorsal aspect; 161: First-third metasomal tergites, dorsal aspect; 162: Wings; 163: Head, dorsal aspect; 164: Head, anterior aspect; 165: Head, lateral aspect; 166: Middle and hind legs, lateral aspect.

a short and shallow longitudinal groove (Plate 160), distinctly impressed and finely crenulate; scutellar sulcus 0.4 times as long as dorsal face of scutellum and with 1 long and 4 short crenulae; scutellum sparsely punctulate and slightly convex; prepectal carina wide lamelliform; precoxal sulcus rather narrow, crenulate and only posterior half present (Plate 159); epinomial area punctulate, remainder of mesopleuron shiny and punctulate; mesosternal suture narrow, shallow and smooth; metapleuron with rather dense setosity and entirely coarsely reticulate; propodeum distinctly areolate and interspaces largely smooth, shiny, its spiracle small and round, lateral carina lamelliform. Wings. Fore wing: 2-R1 as long as 1-R1; 1-R1 0.5 times as long as pterostigma; pterostigma semi-oval; marginal cell subparallel-sided and narrow, SR1 curved towards pterostigma (Plate 162); r:SR1:2-SR = 2:43:4; second submarginal cell small and petiolate, petiolus twice as long as 2-SR; cu-a distinctly postfurcal; basal half of wing regularly setose but with less dense setosity than apical half. Hind wing: with 3 hamuli; vein M+CU 1.5 times as long as vein 1-M; surroundings of cu-a with sparse setosity. Legs. Length of hind femur, tibia and basitarsus 2.7, 5.3 and 7.0 times their width, respectively; hind femur largely smooth and shiny; inner side of hind tibia with small tubercle subbasally; outer side of middle and hind tibiae with 1 and no peg above apical cluster, respectively; length of outer and inner spurs of middle tibia 0.45 and 0.50 times middle basitarsus; length of outer and inner spurs of hind tibia 0.35 and 0.5 times hind basitarsus; fore femur moderately slender and tarsus slender; tarsal claws with minute acute lobe. Metasoma. First tergite strongly widened apically, not constricted behind spiracles and as long as its apical width (Plate 161), shiny and densely longitudinally striate, dorsal carinae fine and present laterally close to apex of tergite; second tergite smooth, with distinctly differentiated wide elliptical basal area and posteriorly with distinct transverse depression; second tergite 0.7 times as long as third tergite, transverse and hardly widened posteriorly (Plate 161); second metasomal suture distinctly impressed; metasoma largely glabrous, tergites at most with apical row of setae; ovipositor sheath slender (but widened apically) and with medium-sized setae; setose part of ovipositor sheath 0.45 times as long as fore wing, 0.8 times as long as metasoma and 1.3 times as long as hind tibia.

Colour. Yellowish-brown; antenna, middle and hind tarsi (except basally), part of apex of hind tibia, veins of fore wing anteriorly, parastigma, pterostigma and ovipositor sheath dark brown; palpi, labrum, tegulae and fore and middle legs, remainder of legs, pronotum ventrally, propodeum posteriorly and metasoma more or less brownish-yellow; wings weakly subhyaline; remainder of wing veins brown.

Biology: Unknown.

Distribution: Yemen.

Etymology: The name "*sulciferus*" refers to the short groove ("sulcus" in Latin and "ferus" in Latin is a suffix meaning carrying or having) of the mesoscutum.

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Author's address:

C. van Achterberg, Department of Terrestrial Zoology, NCB Naturalis, Postbus 9517, 2300 RA Leiden, The Netherlands; e-mail: Kees.vanAchterberg@ncbnaturalis.nl

Order Hymenoptera, family Megaspilidae

Genus *Dendrocerus*

Istvan Mikó, Matthew J. Yoder and Andrew R. Deans

INTRODUCTION

Hymenoptera is the most species-rich insect order, with more than 145000 described species (Huber, 2009). Recent estimates suggest that 10–20% of all insects are parasitic Hymenoptera (Godfray, 1994; Quicke, 1997; Whitfield, 2003). Ceraphronoidea comprises some 610 described species and 32 genera worldwide (Johnson & Musetti, 2004). Modern Ceraphronoidea taxa are present in all habitats except for the Polar Regions and are most diverse and abundant in the tropics and subtropics, similarly to the most other parasitic Hymenoptera. Most ceraphronoid wasps are primary endoparasitoids of entomophagous insects, and this is probably the ground plan biology for the superfamily. The host range of the Ceraphronoidea is large and includes species classified at least eight orders: Diptera (Dessart, 2001), Hymenoptera (Ghesquiere, 1960), Coleoptera (Ghesquiere, 1960), Thysanoptera (Dessart & Bournier, 1971), Mecoptera (Cooper & Dessart, 1975), Homoptera (Dessart, 1975), Trichoptera (Luhman et al., 1999) and Neuroptera (Dessart, 1985).

Members of the most well-known ceraphronoid genus, *Dendrocerus* are usually hyperparasitoids of aphids. *Dendrocerus* belongs to the subfamily Megaspilinae, which is easily distinguished from other Ceraphronoidea by the combination of the following characters: presence of posterior mesotibial spur, subdivision of the metasomal synsternum, bifurcated calcar, parossiculus distolaterally separated from gonostipes, 9 female flagellomeres, pterostigma and occipital depression, absence of Waterston's organ and axillar setae (Masner & Dessart, 1964; Mikó & Deans, 2009). Although numerous authors have attempted to describe diagnostic characters for megaspiline genera (Dessart & Cancemi, 1987; Dessart, 1995, 2001; Alekseev, 1978; Fergusson, 1980) there have always been some species of each genus possessing the diagnostic character state of another genus. For instance, the presence of laterally asymmetric male flagellomeres has been proposed as diagnostic character for *Dendrocerus*. In some *Dendrocerus* species, however, like *Dendrocerus propodealis* Dessart, 1985, the male flagellomeres are not asymmetric, or at least not more asymmetric than flagellomeres in some *Conostigmus* males (e.g. in *Conostigmus scabriceps* (Dodd, 1916), IM personal observation). The only way to clarify the limits between megaspiline genera is through phylogenetic analyses using morphological or molecular characters, which is beyond the scope of the present paper.

Using the male genitalia, however, it is possible to identify most Megaspilidae species with a high level of certainty. Following the already proposed species concepts and species-level classifications of Megaspilinae (Dessart & Cancemi, 1987; Dessart, 1995, 2001; Alekseev, 1978; Fergusson, 1980) we revise the megaspiline species presently treated as *Dendrocerus* that have been collected in the United Arab Emirates and those whose occurrence in the country is assumed. Despite the uncertain limits of megaspiline genera, there are certain species groups within both *Conostigmus* and *Dendrocerus* with well-defined limits. Species classified in *Conostigmus* (*Conostigmus*) possess independent parossiculi. Parossiculi are always fused in all *Dendrocerus* species where males have been described (e.g. Dessart, 1972, 1985, 1995, 1999, 2001). Similarly the notauli are complete in all *Conostigmus* species, whereas posteriorly reduced notauli are diagnostic for a group of *Dendrocerus* species (Dessart, 1985). *Dendrocerus* species that have posteriorly reduced notauli also seem to be

sharing other thoracic characters: lateral axillar surface higher than long, epicnemium triangle shaped, epicnemial carina incomplete or absent, antecostal line of the abdominal tergum 1 manifesting externally as sulcus, transverse line of metanotum fusing with antecostal sulcus only medially, and speculum (mesopleural area corresponding with the site of origin of anterior mesofurco-mesopleural muscle) extending ventrally of the mesopleural pit. Describing new megaspiline species is problematic, unless the new species belongs to a well-defined species group. The new species described here is a member of the *Dendrocerus* species group with incomplete notauli.

The UAE species of the ceraphronoid genus *Dendrocerus* are here reviewed based on specimens have been collected during the UAE Insect Project. *Dendrocerus aphidum*, *D. annecki*, *D. indicus*, *D. perlucidus* and *D. propodealis* are redescribed. *Dendrocerus vivianae* Mikó & Deans nov. spec. is described. An identification key for UAE species is provided, both in this publication and on the World Wide Web, and *Dendrocerus propodealis* and *D. annecki* are recorded for the first time from the Palaearctic region.

MATERIALS AND METHODS

Terms for skeletal features follow Hymenoptera Anatomy Ontology (Yoder et al, in review). General observations were made by stereomicroscope (Olympus) at 160× magnification. Some specimens were examined on slide mounts embedded in Canada balsam (Prinsloo, 1980). Images were taken by Olympus DP71 digital camera attached to Olympus CX41 compound microscope using DP71 controller software. A series of photographs were prepared by focusing the sharpness on different levels of the structure. Pictures were combined by CombineZP (Hadley 2010) using “do combine” and “do soft combine” “do average and filter” and commands. Images were processed in Adobe Photoshop CS4. Abbreviations for collections used in taxonomic reference follow Johnson (1992). Taxonomic descriptions have been generated and identification key have been produced using mx (Yoder et al., 2010).

The specimens dealt with were deposited in the collection of the North Carolina State University (NCSU) (see Appendix 1) and the United Arab Emirates Invertebrate Collection.

SYSTEMATIC ACCOUNT

Key to the species of *Dendrocerus* Ratzeburg, 1852, in the United Arab Emirates

- 1 Median projection of lateral propodeal carina present (Plate 1), metasoma concolourous with mesosoma (Plate 3), head lighter below eye midlevel than above eye midlevel (Plate 5), 6th male flagellomere 1.0–1.4 times as long as wide (Plate 7), female pedicel longer than 1st flagellomere (Plate 9), epicnemial carina complete medially and epicnemium posterior margin convex (mesofurcal pit absent) (Plate 11), number of parossicular setae more than 2 (Plate 14), distal parossicular projection absent (Plate 14) *Dendrocerus propodealis* Dessart
- Median projection of lateral propodeal carina absent (Plate 2), metasoma lighter than mesosoma (Plate 4), head concolourous below and above eye midlevel (Plate 6), 6th male flagellomere more than 2× as long as wide (Plate 8), female pedicel shorter than 1st flagellomere (Plate 10), epicnemial carina absent or incomplete medially or epicnemial carina complete and epicnemium posterior margin concave (mesofurcal pit present) (Plate 12), number of parossicular setae 2 or less than 2 (Plate 14a), distal parossicular projection present (Plate 14a) 2



Plates 1–2. Mesosoma, posterodorsal view. 1: *Dendrocerus propodealis* Dessart; 2: *Dendrocerus aphidum* Rondani. al=antecostal line, lpc=lateral propodeal carina. Scale bars = 0.1mm.

- 2 Preoccipital lunula absent in male (Plate 15), notaulus complete (Plate 17), lateral axillar area longer than high (Plate 19), epicnemial carina complete (Plate 12), median notch of distodorsal margin of gonostipes square (Plate 21), distal parossicula projection trapezoid with with parossicula seta located medially on projection (Plate 23). *Dendrocerus aphidum* Rondani
- Preoccipital lunula present in male (Plate 16), notaulus incomplete (Plate 18), lateral axillar area higher than long (Plate 20), epicnemial carina incomplete or absent (Plates 33, 34), median notch of distodorsal margin of gonostipes rounded (Plate 22), distal parossicula projection pointed or square-shaped with parossicula setae located apically on projection (Plate 24) 3
- 3 First abdominal sternum and corresponding area on syntergum white, elongate (Plate 25), mesopleural sulcus absent (Plate 27), lateral propodeal carinae inverted 'y'-shaped (Plate 29), lateral margins of parossiculi converging proximally (Plate 31) *Dendrocerus anneckeii* Dessart
- First abdominal sternum and corresponding area on syntergum brown, transverse (Plate 25), mesopleural sulcus present (Plate 28), lateral propodeal carina inverted 'v'-shaped (Plate 30), lateral margins of parossiculi diverging or parallel proximally (Plate 32) 4
- 4 Epicnemial carina present laterally (Plate 33), posterodorsal metapleural area trapezoid (Plate 35), harpe bilobed (Plate 36), distal parossicula projection square with two parossicula setae (Plates 38, 39), dorsal apodeme of the penisvalva absent and distal projection of the penisvalva present (Plate 40) *Dendrocerus vivianae* Mikó & Deans **nov. spec.**
- Epicnemial carina absent (Plate 34), posterodorsal metapleura area triangular (Plates 20, 28), harpe simple (Plate 37), distal parossicula projection simple with one parossicula seta (Plate 37), dorsal apodeme of the penisvalva present and distal projection of the penisvalva absent (Plate 41) 5
- 5 Gonossiculus like in Plate 37, harpe median margin concave (Plate 43) *Dendrocerus perlucidus* Alekseev
- Gonossiculus like in Plate 14, harpe median margin convex (Plate 42) *Dendrocerus indicus* Mani

Dendrocerus anneckeii Dessart, 1985

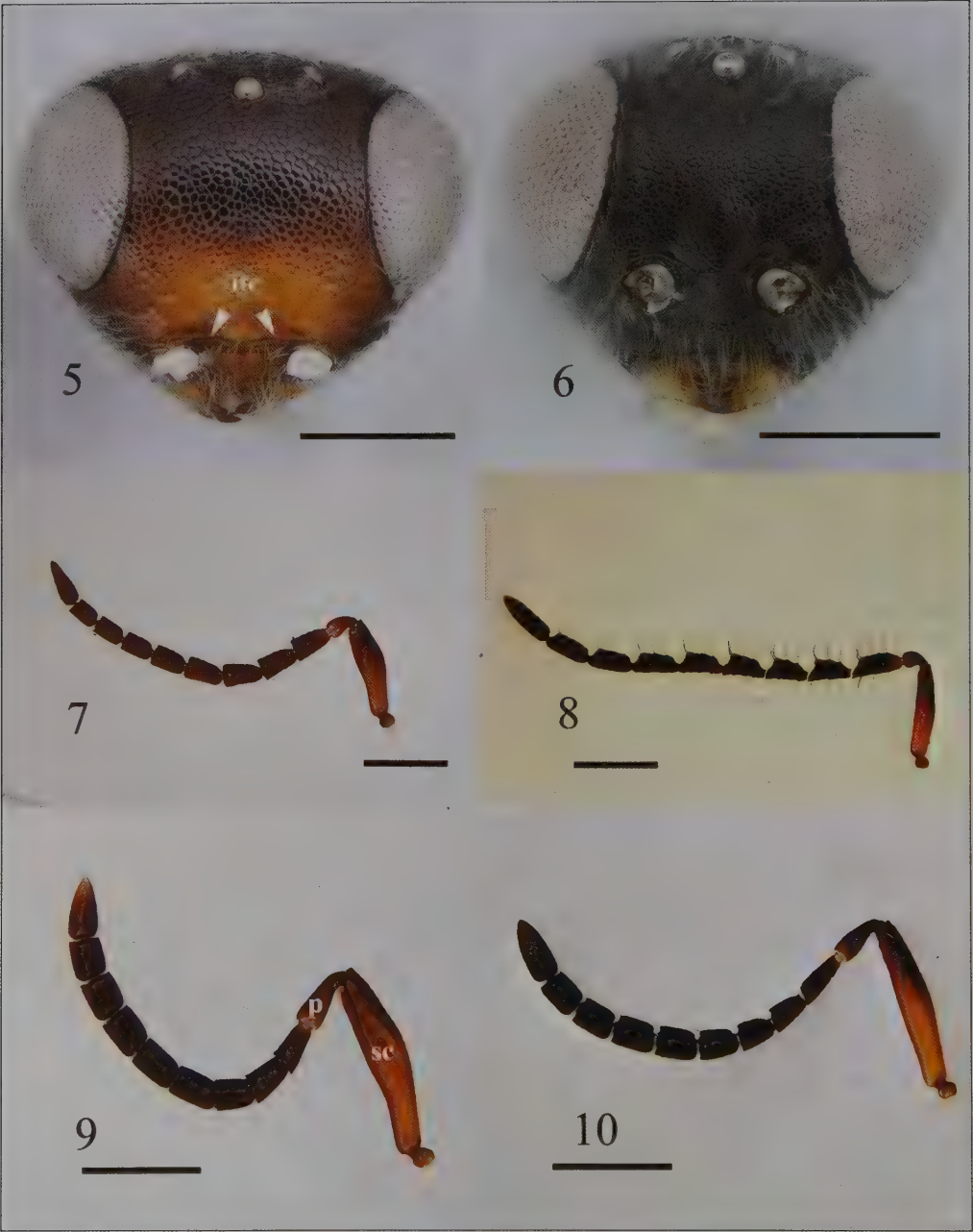
Specimens examined: SOUTH AFRICA: Kwazulu-Natal Pietermaritzburg, 1♂, 17–23.xi.2003, leg. M. Mostovsky. YEMEN: Ar-Rujum, 4♂, 2♀, 16.x.2000–15.i.2001, Malaise trap, leg. A. van Harten.

Diagnosis: Differs from other *Dendrocerus* species with reduced notaulus in the absence of mesepimeral sulcus, in the 'y'-shaped lateral propodeal carina, in the proximally converging lateral margin of parossiculi and the elongate and whitish first abdominal sternite and corresponding syntergal area.

Description: Colour. Colour of antenna (male): Flagellum brown, scape proximally yellowish. Colour of head (male): Brown. Colour of mesosoma (male): Dark brown. Colour of legs (male): Brown, fore tibia yellowish (meso- and metatibiae sometimes lighter proximally). Colour of metasoma (male): First metasomal sternal sclerite and corresponding area on the syntergum white. Colour of antenna (female): Flagellum dark brown, scape and pedicel light brown. Colour of head (female): Yellowish. Colour of mesosoma (female): Yellowish, propodeum darker, mesoscutellum lighter brown. Colour of legs (female): Yellow except meso- and metatibiae and femora brownish in distal 2/3. Colour of metasoma (female): First metasomal sternal sclerite and corresponding area on the syntergum white. Metasoma lighter than mesosoma.



Plates 3–4. Habitus, lateral view. 3: *Dendrocerus propodealis* Dessart; 4: *Dendrocerus aphidum* Rondani. Scale bars = 1.0 mm.



Plates 5–10. 5, 7, 9, *Dendrocerus propodealis* Dessart. 5: Head, anterior view; 7: Male antenna; 8: Female antenna. 6, 8, 10, *Dendrocerus aphidum* Rondani. 6: Head, anterior view; 8: Male antenna; 10: Female antenna. itc: intertorular carina, p: pedicel, sc: scape. Scale bars = 0.2 mm.

Head. Preoccipital lunula (male) present. Preoccipital carina present medially posterior of lateral ocelli, following the curvature of the ocelli. Facial pit absent. Intertorular carina absent. Ventral margin of torulus vs. dorsal margin of clypeus not adjacent. Scape longer than or equal to F1+F2 (male). Mesosoma. Ventral pit of pronotum absent. Notaulus reduced posteriorly. Lateral axillar area distinctly higher than long. Mesopleural sulcus absent. Epicnemium posterior margin triangular. Epicnemial carina absent. Dark area on fore wing present. Shape of lateral propodeal carinae like inverted 'Y'. Transverse line of the metanotum/propodeum fused medially fusion with antecostal line of abdominal tergum 1. Median projection of lateral propodeal carina absent. Antecostal line externally forming sulcus. Speculum ventrally in relation to mesopleural pit. Metapleural carina present. Posterodorsal metapleural area trapezoid-shaped. Lateral propodeal carina present. Lateral propodeal carina (male) bent inward, extending towards propodeal spiracle. Lateral propodeal carina (female) bent inward, extending towards propodeal spiracle.

Metasoma. Abdominal sternum 2 elongate. Length of abdominal tergum 9 medially short. Proximodorsal apodeme of cupula absent. Proximodorsal notch of cupula absent. Median notch of distodorsal margin part of gonostipes rounded, not reaching half of the length of the dorsal gonostipes. Gonostipes proximodorsal margin with deep concavity medially. Harpe shape simple. One parossicular seta present. Distal parossicular projection simple. Dorsal apodeme of the penisvalva absent. Distal projection of penisvalva absent.

Biology: Parasitoid of *Conwentzia capensis* Tjeder, 1969 (Neuroptera: Coniopterygidae) (Dessart, 2001).

Distribution: *Dendrocerus annekei* is widely distributed in Ethiopian region (Dessart, 2001). The Yemeni specimens are the first records of the species from the Arabian Peninsula.

***Dendrocerus aphidum* (Rondani, 1877)**

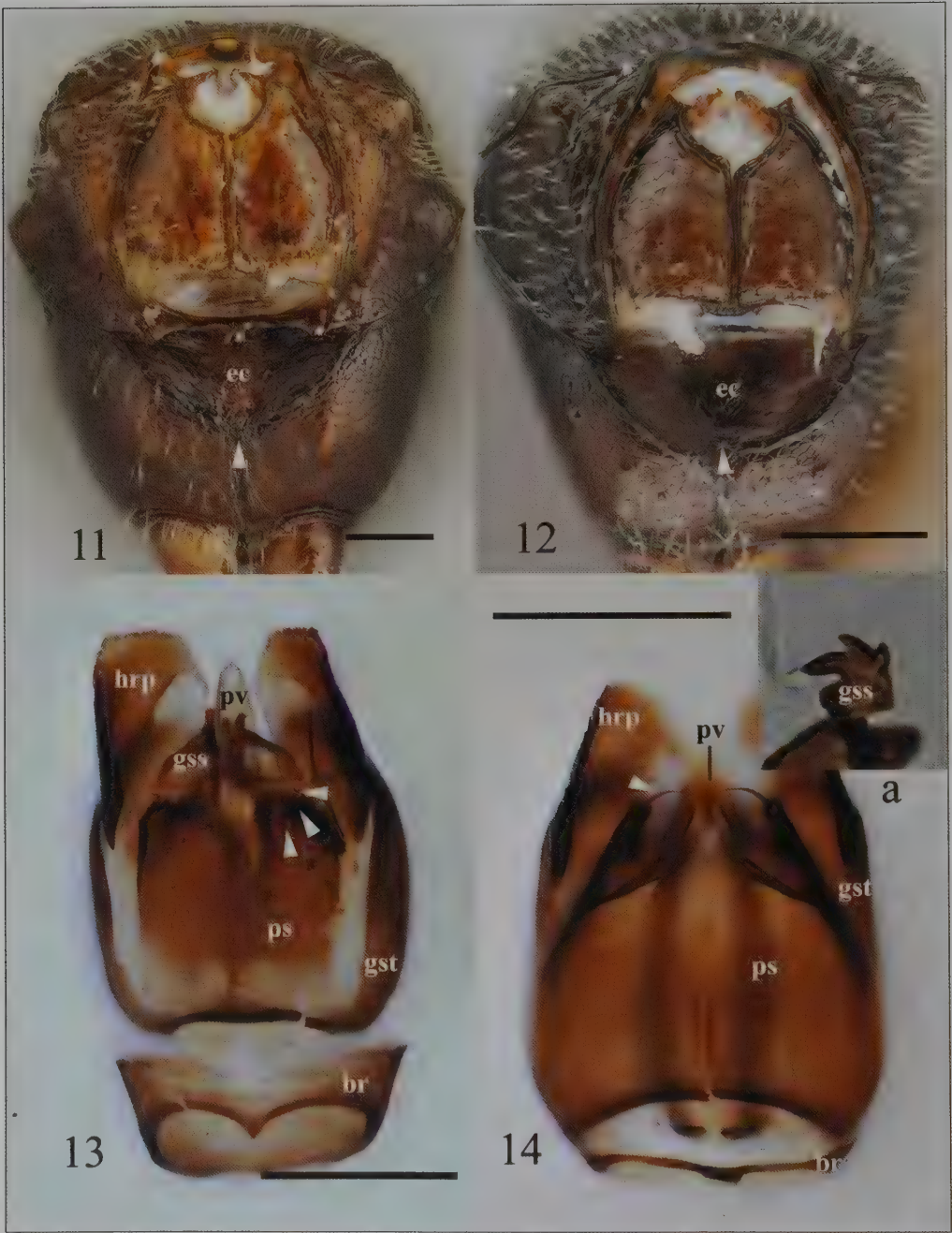
Specimens examined: Ar-Rafah, 1♀, 17.iii.2009, water traps, leg. C. Schmid-Egger. Sharjah Desert Park, 1♂, 2♀, 29.iii–6.iv.2005, light trap, leg. A. van Harten. Wadi Bih dam, 27♀, 25.ii–8.iii.2009, Malaise trap; 4♂, 22–26.iii.2009, water traps; all leg. A. van Harten. Hatta, 2♂, 8–26.iv.2006, light trap, leg. A. van Harten. Wadi Wurayah farm, 1♀, 17–24.iii.2009; 2♀, 24–30.iii.2009; all Malaise trap, leg. A. van Harten.

Diagnosis: Differs from all other *Dendrocerus* species by the combination of the presence of concave area on the apical projection of parossiculus bearing medially parossicular seta and the square distodorsal notch of gonostipes with median, ventrally bent area.

Description: Colour of antenna (male): Flagellum brown, scape proximally yellowish. Colour of head (male): Dark brown. Colour of mesosoma (male): Dark brown. Colour of legs (male): Yellowish, tibiae and femora light brown medially. Colour of metasoma (male): Brownish all over. Colour of antenna (female): Flagellum and pedicel dark brown, distal 2/3 of scape light brown. Colour of head (female): Dark brown. Colour of mesosoma (female): Light brown. Colour of legs (female): Yellowish brown, tibiae and femora light brown medially. Colour of metasoma (female): Brownish all over. Metasoma lighter than mesosoma.

Head. Preoccipital lunula (male) absent. Preoccipital carina present medially posterior of lateral ocelli, following the curvature of the ocelli. Facial pit present. Intertorular carina absent. Ventral margin of torulus and dorsal margin of clypeus not adjacent. Scape longer than or equal to F1+F2 (male).

Mesosoma. Ventral pit of pronotum present. Notaulus complete. Lateral axillar area as long as high or longer than high. Mesopleural sulcus present. Epicnemium posterior margin concave-shaped medially, mesofurcal pit present. Epicnemial carina complete. Dark area on



Plates 11–14. 11, 13, *Dendrocerus propodealis* Dessart. 11: Mesosoma, anterior view; 13: Male genitalia, ventral view. 12: *Dendrocerus aphidum* Rondani: mesosoma, anterior view. 14: *Dendrocerus indicus* Mani, male genitalia, ventral view. br: basal ring. ec: epinemium, gss: gonossiculus, gst: gonostipes, hrp: harpe, ps: parossiculus, arrowheads showing median part of epinemial carina on Plates 11, 12, parossicula setae on Plates 13, 14. Scale bars = 0.1 mm.



Plates 15–20. 15, 17, 19, *Dendrocerus aphidum* Rondani. 15: Head, dorsal view; 17: Mesosoma, dorsal view; 19: Mesosoma, lateral view. 16, 18, *Dendrocerus indicus* Mani. 16: Head, dorsal view; 18: Mesosoma, dorsal view. 20: *Dendrocerus perlucidus* Alekseev, mesosoma, lateral view. laa: lateral axillar area, pc: preoccipital carina, pl: preoccipital lunula, pma: posterodorsal metapleural area, arrowheads showing notaulus on Plates 17, 18. Scale bars = 0.1 mm.

fore wing present. Lateral propodeal carinae in shape of inverted 'V'. Transverse line of the metanotum/propodeum fused sublaterally with antecostal line of abdominal tergum 1. Median projection of lateral propodeal carina absent. Antecostal line externally with carina. Most ventral point of speculum dorsally to mesopleural pit. Metapleural carina present. Posterodorsal metapleural area trapezoid-shaped. Lateral propodeal carina present. Lateral propodeal carina (male) bent outward, extending far from spiracle. Lateral propodeal carina (female) bent outward, extending far from propodeal spiracle.

Metasoma. Abdominal sternum 2 transverse-shaped. Abdominal tergum 9 medially long. Proximodorsal apodeme of cupula present. Proximodorsal notch of cupula absent. Median notch square with ventrally bent median area, not reaching half of the length of the dorsal gonostipes. Gonostipes proximodorsal margin convex medially. Harpe simple. One parossicular seta present. Distal parossicular projection with median concave area (parossicular setae located medially on median concave area). Dorsal apodeme of the penisvalva absent. Distal projection of penisvalva absent.

Biology: *Dendrocercus aphidum* is the parasitoid of numerous Aphidiinae species (Hymenoptera: Braconidae) (Fergusson, 1980).

Distribution: *Dendrocercus aphidum* is one of the most widely distributed *Dendrocercus* species. Specimens have been reported from Europe, North and South America, Australia and New Zealand (Dessart, 2001).

***Dendrocercus indicus* (Mani, 1939)**

Specimens examined: Al-Ajban, 2♂, 22.x–9.xi.2005, Malaise trap; 1♂, 9.xi–7.xii.2005, light & Malaise trap; 1♂, 2♀, 1.iv–2.v.2006, Malaise trap; all leg. A. van Harten.

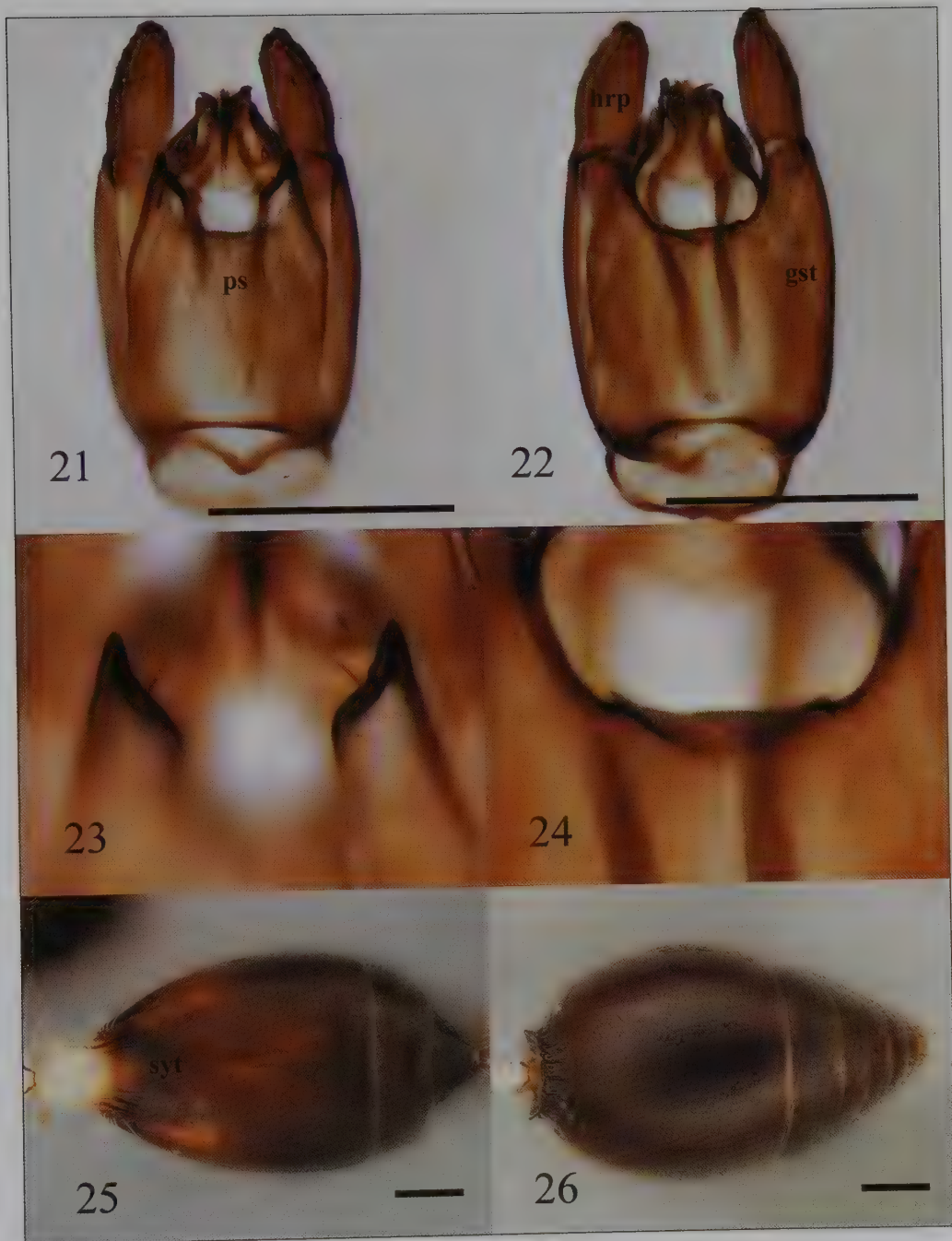
Diagnosis: *Dendrocercus indicus* is most closely related to *D. perlucidus* Alekseev, differs from it by the straight median margin of the harpe and the shape of the gonosticulus.

Description: Colour. Colour of antenna (male): Flagellomeres and pedicel yellowish-whitish, scape light brown. Colour of head (male): Brown. Colour of mesosoma (male): Dark brown. Colour of legs (male): Light brown, tibiae and tarsi lighter than coxae and femora. Colour of metasoma (male): Brownish all over. Metasoma lighter than mesosoma.

Head. Preoccipital lunula (male) present. Preoccipital carina present medially, posterior of lateral ocelli, following the curvature of the ocelli. Facial pit present. Intertorular carina absent. Ventral margin of torulus and dorsal margin of clypeus not adjacent. Scape shorter than F1+F2 (male).

Mesosoma. Ventral pit of pronotum absent. Notaulus reduced posteriorly. Lateral axillar area distinctly higher than long. Mesopleural sulcus present. Epicnemium posterior margin triangular. Epicnemial carina absent. Dark area on fore wing absent. Lateral propodeal carinae in shape of inverted 'V'. Transverse line of mesothorax/metathorax/propodeal complex present. Median projection of lateral propodeal carina absent. Antecostal line externally with sulcus. Most ventral point of speculum ventrally to mesopleural pit: Metapleural carina absent or present. Posterodorsal metapleural area triangular. Lateral propodeal carina absent or present. Lateral propodeal carina (male) bent inward, extending towards propodeal spiracle. Lateral propodeal carina (female) bent inward, extending towards propodeal spiracle.

Metasoma. Abdominal sternum 2 transverse-shaped. Abdominal tergum 9 short medially. Proximodorsal apodeme of cupula absent. Proximodorsal notch of cupula absent. Median notch of distodorsal margin part of gonostipes rounded, not reaching half of the length of the dorsal gonostipes. Gonostipes proximodorsal margin straight or slightly concave. Harpe simple. One parossicular seta present. Distal parossicular projection simple. Dorsal apodeme of the penisvalva present. Distal projection on penisvalva absent.



Plates 21–26. 21–24, *Dendrocerus aphidum* Rondani. 21: Male genitalia, ventral view; 22: Male genitalia, dorsal view; 23: Apical projection of parossiculus, ventral view; 24: Distodorsal margin of gonostipes, dorsal view. 25: *Dendrocerus anneckeii* Dessart, metasoma, dorsal view. 26: *Dendrocerus vivianae* nov. spec., metasoma, dorsal view. gst: gonostipes, hrp: harpe, ps: parossiculus. Scale bars = 0.1 mm.



Plates 27–28. 27: *Dendrocerus anneckei* Dessart, mesosoma, lateral view; 28: *Dendrocerus indicus* Mani, mesosoma, lateral view. pma: posterodorsal metapleural area, arrows showing mesopleural sulcus. Scale bars = 1 mm.

Remarks: The presence of the propodeal carina and metapleural carina is variable within the species and seems to be body size dependent.

Biology: *Dendrocerus indicus* is the parasitoid of the *Nimboa basipunctata* Withcombe, 1925 (Neuroptera: Coniopterygidae), *Semidalis pseudouncinata* Meinander, 1963 (Neuroptera: Coniopterygidae) and *Etsuhia thuriferae* Skuvrava, 1995 (Diptera: Cecidomyiidae) (Dessart, 2001).

Distribution: India and Europe (Dessart, 2001).

***Dendrocerus perlucidus* Alekseev, 1983**

Specimens examined: Ar-Rafah, 1♂, 17.iii.2009, water traps, leg. C. Schmid-Egger. Wadi Wurayah farm, 1♂, 24–30.iii.2009, Malaise trap, leg. A. van Harten.

Diagnosis: *Dendrocerus perlucidus* is most closely related to *Dendrocerus indicus* Mani, differs from it by the concave median margin of the harpe and the shape of the gonosticulus.

Description: Colour. Colour of antenna (male): Brown, flagellomeres distally lighter. Colour of head (male): Brown. Colour of mesosoma (male): Dark brown. Colour of legs (male): Brown, fore tibia yellowish (meso and metatibiae sometimes lighter proximally). Colour of metasoma (male): Brownish all over. Metasoma and mesosoma concolorous.

Head. Preoccipital lunula (male) present. Preoccipital carina absent. Facial pit absent. Interocular carina absent. Ventral margin of torulus and dorsal margin of clypeus adjacent. Scape shorter than F1+F2 (male).

Mesosoma. Ventral pit of pronotum absent. Notaulus reduced posteriorly. Lateral axillar area distinctly higher than long. Mesopleural sulcus present. Epicnemium posterior margin triangular. Epicnemial carina absent. Dark area on fore wing absent. Lateral propodeal carinae shaped like inverted 'V'. Transverse line of the metanotum/propodeum fused medially with antecostal line of abdominal tergum 1. Median projection of lateral propodeal carina absent. Antecostal line externally with sulcus. Most ventral point of speculum ventrally to mesopleural pit: Metapleural carina present. Posterodorsal metapleural area triangular. Lateral propodeal carina present. Lateral propodeal carina (male) bent inward, extending towards propodeal spiracle. Lateral propodeal carina (female) bent inward, extending towards propodeal spiracle.

Metasoma. Abdominal sternum 2 transverse-shaped. Abdominal tergum 9 short medially. Proximodorsal apodeme of cupula absent. Proximodorsal notch of cupula absent. Median notch of distodorsal margin part of gonostipes rounded, not reaching half of the length of the dorsal gonostipes. Gonostipes proximodorsal margin straight or slightly concave. Harpe simple. One parossicular seta present. Distal parossicular projection simple. Dorsal apodeme of the penisvalva present. Distal projection on penisvalva absent.

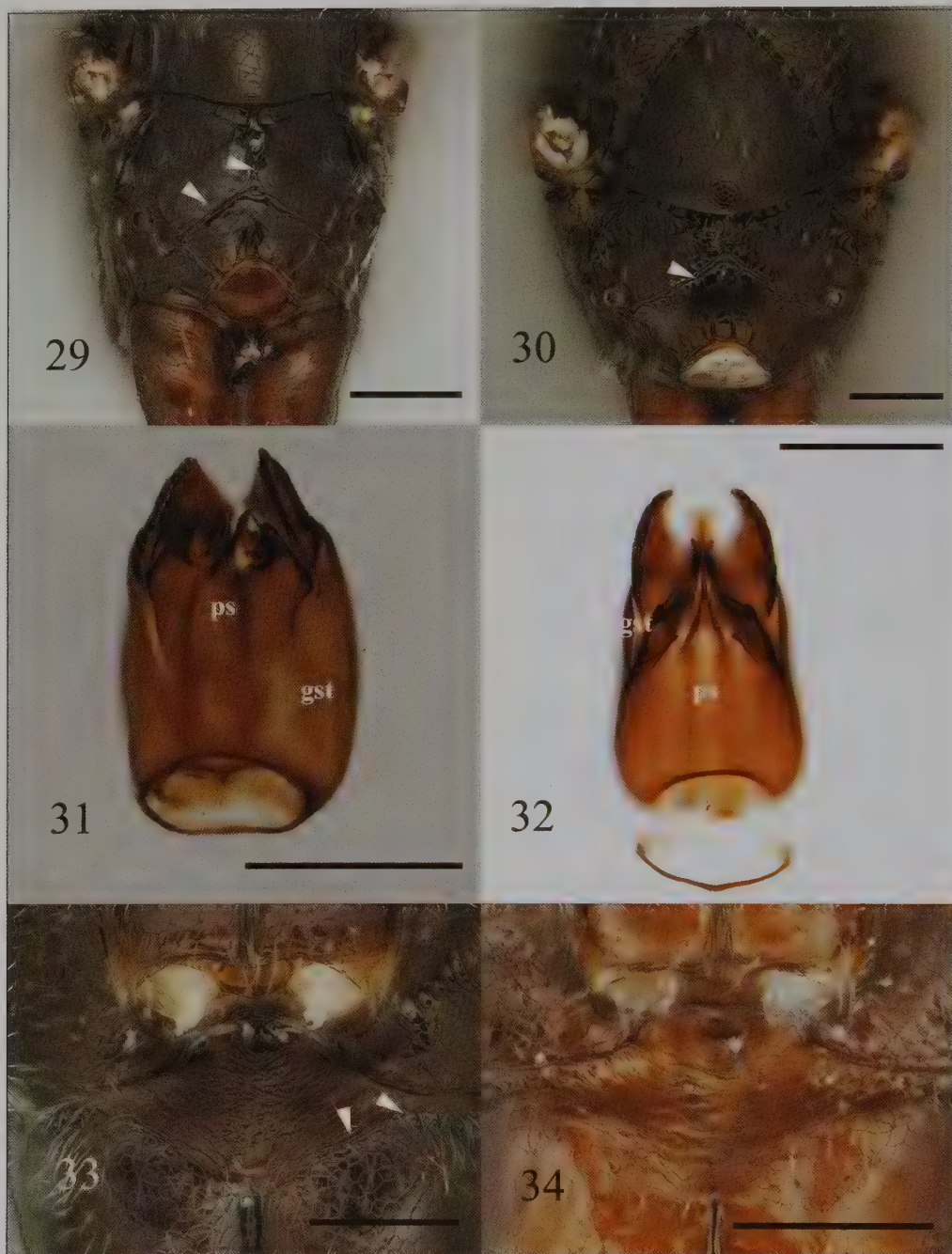
Biology: Unknown

Distribution: *Dendrocerus perlucidus* is an Old world species reported from Europe and Africa.

***Dendrocerus propodealis* Dessart, 1973**

Specimens examined: Al-Ajban, 1♀, 9.xi–7.xii.2005, light & Malaise traps; 3♂, 8♀, 26.ii–2.iv.2006, Malaise Trap; 3♀, 2.iv–2.v.2006, Malaise trap; all leg. A. van Harten. Fujairah, 1♀, 5.iii–6.iv.2005, light trap, leg. A. van Harten. Ar-Rafah, 1♀ 17.iii.2009, water traps, leg. C. Schmid-Egger. National Avian Research Centre, near Sweihan, 1♀, 2–30.iv.2005, light trap, leg. A. van Harten. Wadi Bih dam, 2♀, 25.ii–8.iii.2009, Malaise trap, leg. A. van Harten. Wadi Wurayah farm, 8♀, 17–24.iii.2009, Malaise trap; 2♀, 24–30.iii.2009, Malaise trap; all leg. A. van Harten.

Diagnosis: *Dendrocerus propodealis* differs from all other *Dendrocerus* species by having the median part of the lateral propodeal carinae posteriorly extended.



Plates 29–34. 29: *Dendrocerus annekei* Dessart, mesosoma, posterodorsal view; 30: *Dendrocerus vivianae* nov. spec., mesosoma, posterodorsal view; 31: *Dendrocerus annekei* Dessart, male genitalia, ventral view; 32: *Dendrocerus perlucidus* Alekseev, male genitalia, ventral view; 33: *Dendrocerus vivianae* nov. spec., mesopectus and prothorax, anterior view; 34: *Dendrocerus indicus* Mani, mesopectus and prothorax, anterior view. pss: parossiculus, gst: gonostipes, arrowheads showing lateral propodeal carina on Plates 29, 30, epomial carina on Plate 33. Scale bars = 0.1 mm.

Description. Colour. Colour of antenna (male): Flagellum brown, scape proximally yellowish. Colour of head (male): Dark brown above light brown below eye midlevel (frontal view). Colour of mesosoma (male): Light brown. Colour of legs (male): Brown, fore tibia yellowish (meso and metatibiae sometimes lighter proximally). Colour of metasoma (male): Brownish all over. Colour of antenna (female): Flagellum dark brown, scape and pedicel light brown. Colour of head (female): Light brown above, yellowish below eye midlevel. Colour of mesosoma (female): Light brown. Colour of legs (female): Yellowish-brown. Colour of metasoma (female): Brownish all over. Metasoma and mesosoma concolorous.

Head. Preoccipital lunula (male) absent. Preoccipital carina absent. Facial pit absent. Intertorular carina absent. Ventral margin of torulus and dorsal margin of clypeus adjacent. Scape longer than or equal to F1+F2 (male).

Mesosoma. Ventral pit of pronotum present. Notaulus complete. Lateral axillar area as long as high, or longer than high. Epicnemium posterior margin convex medially, mesofurcal pit absent. Epicnemial carina complete. Dark area on fore wing present. Lateral propodeal carinae in shape of inverted 'V'. Transverse line of the metanotum/propodeum fused sublaterally with antecostal line of abdominal tergum 1. Median projection of lateral propodeal carina present. Antecostal line external with carina. Most ventral point of speculum dorsally to mesopleural pit. Metapleural carina present. Posterodorsal metapleural area trapezoid-shaped. Lateral propodeal carina present. Lateral propodeal carina (male) bent outward, extending far from spiracle. Lateral propodeal carina (female) bent outward, extending far from propodeal spiracle.

Metasoma. Abdominal sternum 2 transverse-shaped. Abdominal tergum 9 short medially. Proximodorsal apodeme of cupula present. Proximodorsal notch of cupula present. Median notch of distodorsal margin part of gonostipes rounded, not reaching half of the length of the dorsal gonostipes. Gonostipes proximodorsal margin straight or slightly concave. Harpe simple. More than 2 parossicular setae present. Dorsal apodeme of the penisvalva present. Distal projection on penisvalva absent.

Biology: *Dendrocerus propodealis* is a parasitoid of *Chrysopa madestes* Banks, 1911 (Neuroptera: Chrysopidae).

Distribution: *Dendrocerus propodealis* have been collected in India and Africa. The UAE specimens are the first occurrence of the species in the Palearctic region.

***Dendrocerus vivianae* Mikó & Deans nov. spec.**

Specimens examined: United Arab Emirates: Holotype, ♂, Wadi Wurayah, 25°24'N, 56°17'E, 12–14.iv.2005, Malaise trap + water traps, leg. T. Pape (NCSU 22034). Paratypes: 12♂, same data as holotype (NCSU 22032–22039, 22055–22059).

Diagnosis: The species differs from all other *Dendrocerus* species by having square shape apical projection of the parossiculus with two apical setae and the presence of the distal projection of penisvalva.

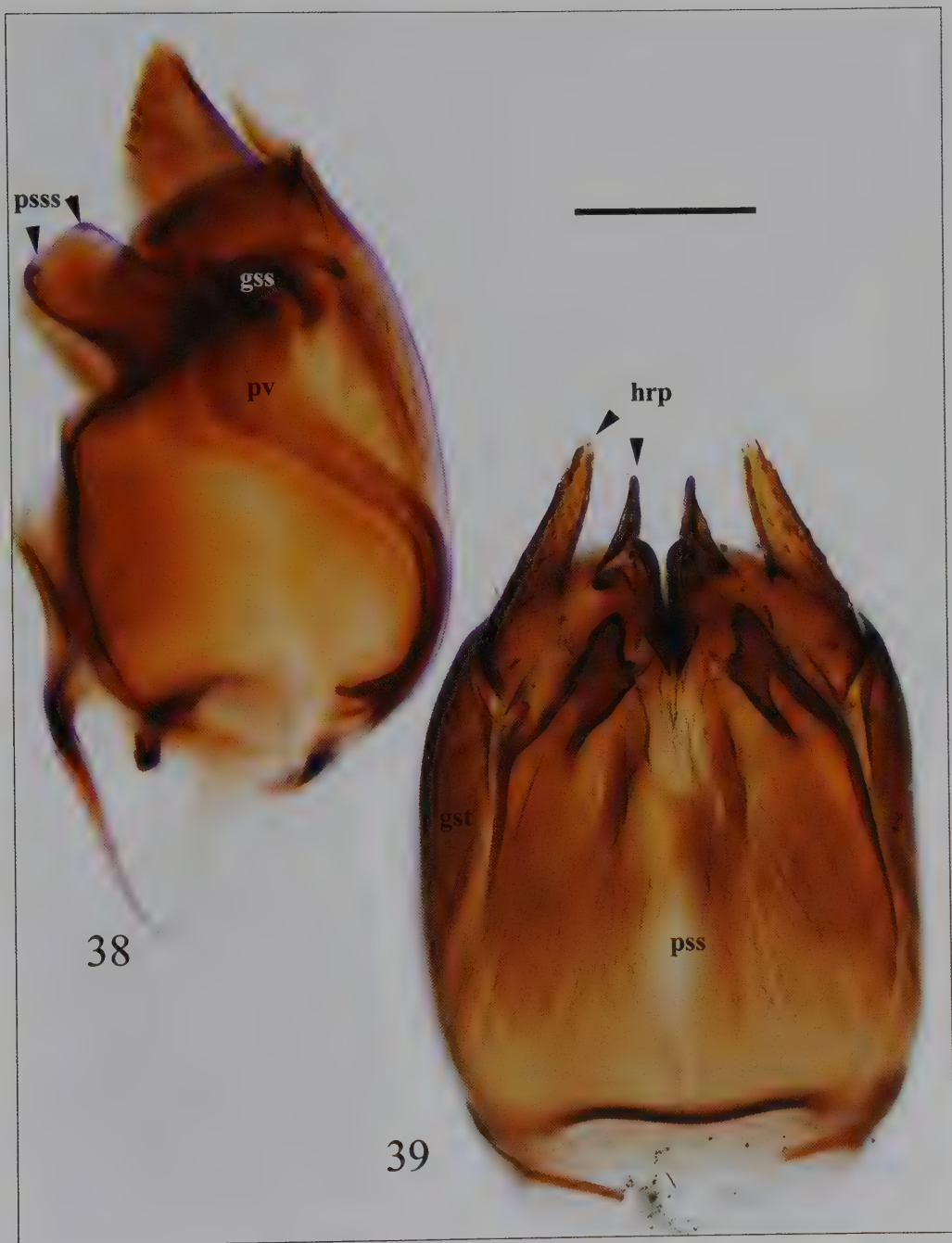
Description. Colour. Colour of antenna (male): Scape and pedicel brown, flagellomeres light brown. Colour of head (male): Dark brown. Colour of mesosoma (male): Dark brown. Colour of legs (male): Brown except whitish tarsi and proximal part of tibiae. Colour of metasoma (male): Brownish all over. Metasoma lighter than mesosoma.

Head. Preoccipital lunula (male) present. Preoccipital carina absent. Facial pit present. Intertorular carina absent. Ventral margin of torulus and dorsal margin of clypeus not adjacent. Scape shorter than F1+F2 (male).

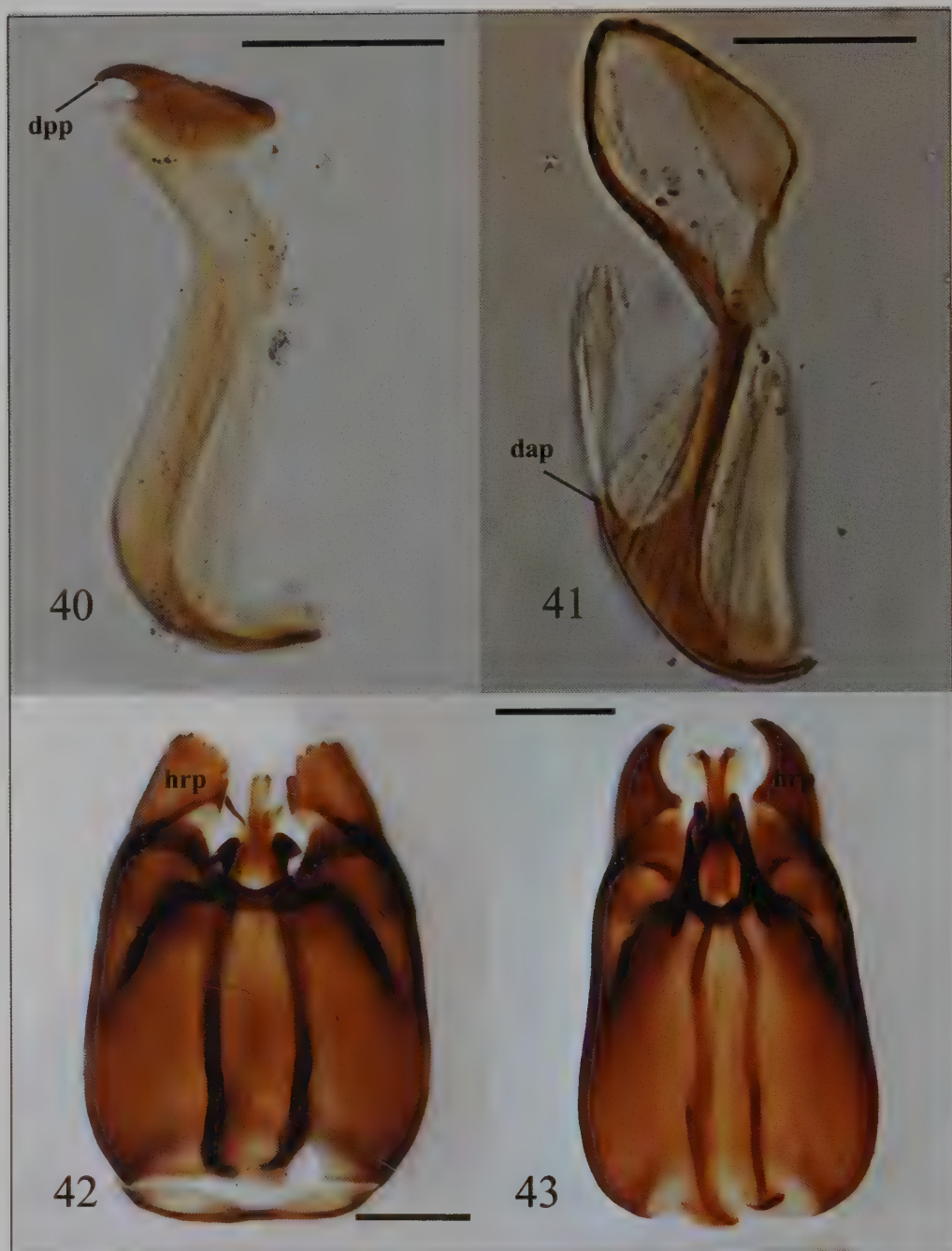
Mesosoma. Ventral pit of pronotum absent. Notaulus reduced posteriorly. Lateral axillar area distinctly higher than long. Mesopleural sulcus present. Epicnemium posterior margin



Plates 35–37. 35, 36, *Dendrocerus vivianae* nov. spec. 35: Mesosoma, lateral view; 36: Gonostipes and harpe, lateral view; 37: *Dendrocerus perlucidus* Alekseev, male genitalia, median view (aedeagus removed). pma: posterodorsal metapleural area, hrp; harpe, gss: gonossiculus, dpp: distal projection of parossiculus. Scale bars = 0.1 mm.



Plates 38–39. *Dendrocerus vivianae* nov. spec. 38: Male genitalia, lateral view; 39: Male genitalia, ventral view. gss: gonossiculus, gst: gonostipes, hrp: harpe, pss: parossiculus, gsss: parossicular setae. Scale bar = 0.05 mm.



Plates 40–43. 40: *Dendrocerus vivianae* nov. spec., penisvalva, median view; 41: *Dendrocerus perlucidus* Alekseev, penisvalva median view; 42: *Dendrocerus perlucidus* Alekseev, male genitalia, dorsal view; 43: *Dendrocerus indicus* Mani, male genitalia, dorsal view. dpp: distal projection of penisvalva, dap: dorsal apodeme of penisvalva, hrp: harpe. Scale bars = 0.05 mm.



Plate 44. *Dendrocerus vivianae* nov. spec., habitus, lateral view. Scale bar = 1 mm.

triangular. Epicnemial carina present only laterally. Dark area on fore wing absent. Lateral propodeal carinae in shape of inverted 'V'. Transverse line of the metanotum/propodeum fused medially with antecostal line of abdominal tergum 1. Median projection of lateral propodeal carina absent. Antecostal line external with sulcus. Most ventral point of speculum ventrally to mesopleural pit. Metapleural carina present. Posterodorsal metapleural area trapezoid-shaped. Lateral propodeal carina present. Lateral propodeal carina (male) bent inward, extending towards propodeal spiracle. Lateral propodeal carina (female) bent inward, extending towards propodeal spiracle.

Metasoma. Abdominal sternum 2 transverse-shaped. Abdominal tergum 9 short medially. Proximodorsal apodeme of cupula absent. Proximodorsal notch of cupula absent. Median notch of distodorsal margin part of gonostipes rounded, not reaching half of the length of the dorsal gonostipes. Gonostipes proximodorsal margin straight or slightly concave. Harpe bilobed. Two parossicular setae present. Distal parossicular projection square-shaped. Dorsal apodeme of the penisvalva absent. Distal projection on penisvalva present.

Remarks: *Dendrocerus vivianae* belongs to *Dendrocerus* based on the ventrally extended speculum, transverse line of the metanotum/propodeum complex medially fused with the antecostal sulcus of T1, medially incomplete epicnemial carina, triangular epicnemium and POL:OOL ratio.

Etymology: *Dendrocerus vivianae* is named after Vivian Simone Deans, the daughter of ARD.

ACKNOWLEDGMENTS

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Authors' addresses:

I. Mikó, M.J. Yoder, A.R. Deans, Insect Museum, Department of Entomology, North Carolina State University, Campus Box 7613, Raleigh, NC 27695-7613, USA; e-mail: istvan.miko@gmail.com, diapriid@gmail.com and andy_deans@ncsu.edu

Appendix 1. Unique identifiers of *Dendrocerus* specimens.

<i>Dendrocerus anneckeï</i> Dessart, 1985	NCSU22048–NCSU22054
<i>Dendrocerus indicus</i> Mani, 1939	NCSU22041, NCSU22043–NCSU22047
<i>Dendrocerus perlucidus</i> Alekseev, 1983	NCSU 22030, NCSU 22031
<i>Dendrocerus propodealis</i> Dessart, 1973	NCSU22000–NCSU22029
<i>Dendrocerus vivianae</i> nov. spec.	NCSU22032–NCSU22039, NCSU22055–NCSU22059
<i>Dendrocerus aphidum</i> Rondani, 1877	NCSU 16849–NCSU 16889

Order Hymenoptera, family Bethyridae

Subfamily Mesitiinae

Diego N. Barbosa and Celso O. Azevedo

INTRODUCTION

The Mesitiinae were first recognized as a tribe by Kieffer (1914); later, Berland (1928) changed their status to subfamily level when he raised Bethyridae from subfamily to family level. The subfamily is represented by 190 species, and includes 13 genera, distributed in the Afrotropical, Oriental and Palaearctic regions; the type-genus is *Mesitius* Spinola, 1851. The most important contributors to the knowledge about the subfamily have been Móczár, who described seven genera and 117 species, Kieffer who described one genus and 30 species, and Nagy who described two genera and 13 species.

The species of Mesitiinae are characterized as follows: Head and mesosoma in most genera strongly sculptured, but in some genera only slightly sculptured; mandible arched and with 3–4 apical teeth; median lobe of clypeus protruding and with median carina higher than antennal insertion, extending to distal margin; antennal insertion fused with median carina of clypeus; flagellum with long hairs (males); gena with ventral depression close to occipital carina; pronotal disc with median carina complete or incomplete, but in some genera this furrow is absent; mesoscutum with longitudinal furrow only in *Sulcomesitius* and *Pilomesitius*; scutellum with scutellar groove, not touching the propodeal disc; propodeal disc with three discal carinae, with a central depression between the carinae, and with a spine at posterior corner, but some species and genera do not have this spine; mesopleuron with transverse groove beginning from mesopleural fovea and extending to ventral margin; forewing (when present) with costal cell visible in dorsal view, and with radial vein long; metasoma with tergum II distinctly longer than others; hypopygium with posterior margin bilobed (male).

According to Nagy (1972), Mesitiinae have two distinctive groups of genera. One of them, with more or less fine sculpture, head and thorax not completely foveolate as below, median longitudinal carina of clypeus sometimes spoon-like, median furrow of pronotal disc not very deep or indistinct, posterior corner of propodeum with moderately long spine, posterior margin of second tergite broadly shining, hypopygium of male with only one basal stalk. The second group of genera represents the strongly sculptured forms, with head and also the pronotum and mesopleuron sometimes very deeply foveolate, clypeal carina always simple, thorax with well-defined pronotal and usually also with mesonotal and scutellar furrow, posterior corners of propodeum with relatively long spine (with few exceptions), posterior margin of second tergite with distinctively coriaceous and polished band, hypopygium of male with a bifurcate basal stalk.

The species of Mesitiinae are perhaps the most rarely collected ones among the Bethyridae. There are normally only few specimens in collections, even in collections with otherwise very rich material. From the UAE, however, a total of 100 specimens of this subfamily were collected, covering 10 species distributed over six genera, about 1.7% of all UAE bethyrids collected.

MATERIALS AND METHODS

The specimens examined were provided by Antonius van Harten and were collected by him in the scope of the 'UAE Insect Project' and the 'Yemen Insect Inventory'. The specimens dealt with are divided between the collection of the Universidade Federal do Espírito Santo (UFES, curator: co-author), the Canadian National Collection of Insects, Ottawa (CNCI), and the UAE Invertebrate Collection.

Terms of body structures generally follow Evans (1964) and Azevedo (1999), the mesopleural and propodeal characters follow Barbosa & Azevedo (2009), but those related to the integument follow Harris (1979). The abbreviations used in the text are as follows: LH = length of head measured dorsally; WH = width of head measured dorsally; WF = width of frons measured dorsally; HE = height of eye measured laterally; OOL = ocelli-ocular distance; WOT = width of the ocellar triangle; DAO = diameter of anterior ocellus; VOL = vertex-ocular line measured dorsally; LFW = length of fore wing; MT = Malaise trap; LT = light trap; WT = water trap; AvH = leg. A. van Harten.

The descriptions and key were elaborated with DELTA (Descriptive Language for Taxonomy) as proposed by Dallwitz et al. (1993).

SYSTEMATIC ACCOUNT

Key to the Mesitiinae from the Arabian Peninsula

Males

- 1 Body strongly sculptured; pronotal disc with median sulcus 2
- Body not strongly sculptured; pronotal disc without median sulcus 5
- 2 Mesoscutum without longitudinal furrow (Plate 20) 3
- Mesoscutum with longitudinal furrow (Plate 28) *Sulcomesitius vanharteni* nov. spec.
- 3 Propodeal disc with spine inconspicuous or absent (Plates 17, 22) 4
- Propodeal disc with spine conspicuous (Plate 21) *Metrionotus indistinctus* nov. spec.
- 4 Clypeus with lateral lobe absent; antenna with first flagellomere as long as pedicel; pronotal disc with longitudinal furrow complete; hypopygium with lobate branch (Fig. 11) *Metrionotus minutissimus* (Móczár)
- Clypeus with lateral lobe present; antenna with first flagellomere longer than pedicel; pronotal disc with longitudinal furrow incomplete; hypopygium with filamentary branch (Fig. 9) *Metrionotus carbonarius* Móczár
- 5 Propodeal disc without sublateral carina (Plate 7); forewing without costal vein *Clytrovorus exaggeratus* nov. spec.
- Propodeal disc with sublateral carina (Plate 4); forewing with costal vein *Anaylax simplicitus* nov. spec.

Females

- 1 Mesoscutum without longitudinal furrow (Plate 15) 2
- Mesoscutum with longitudinal furrow (Plates 12, 31) 3
- 2 Median clypeal carina simple; posterior corner of propodeal disc with distinct spine (Plate 23) (*Metrionotus*) *Metrionotus yarrowi* Móczár
- Median clypeal carina spoon-shaped (Plate 14); posterior corner of propodeal disc without spine (Plate 16) (*Mesitius*) *Mesitius absentis* nov. spec.

- 3 Lateral surface of propodeum with upper carina entering propodeal spine (Plates 24, 32)... 4
- Lateral surface of propodeum with upper carina not entering propodeal spine (Plate 13) ... *Heterocoelia finus* nov. spec.
- 4 Clypeus quadrate, with slightly median emargination; clypeal carina inclined in profile; propodeal disc with short spine (Plate 24) *Sulcomesitius richardsi* Móczár
- Clypeus rounded, without slightly median emargination (Plate 30); clypeal carina arched in profile; propodeal disc with long spine (Plate 32) *Sulcomesitius vanharteni* nov. spec.

Genus *Anaylax* Móczár, 1970

Anaylax has nine valid species all recorded from the Palaearctic region. No hosts have yet been recorded for this genus.

Móczár (1970) described the genus as having: Head with only superficial punctures; clypeus with longitudinal sharp keel; ocelli distinct; antennal segments 1–3 slender, at most slightly thickened medially (♀) or segment 2 narrowed both proximally and distally, with short and inclined hairs (♂), sometimes also slender (♂); pronotum smooth (♀), or hardly punctured (♂), longitudinal furrow absent or hardly visible; mesonotum with notauli and parapsidal furrows, without distinct longitudinal furrows medially, separated from scutellum by a transversal groove and a pair of pits at its base laterally; propodeum with distinct carinae, sublateral carinae also present, lateral angles only with moderate spines, or spines hardly distinct; wings normal, or short; metasoma with tergite II smooth, shining, mostly with distinct but not very deep punctures.

Anaylax simplicitus Barbosa & Azevedo nov. spec.

Plates 1, 3–5, Figures 1, 7

Specimens examined: Holotype: ♂, “UN[ITED] ARAB EMIRATES, Sharjah, 25.21N 55.24E, 01–31.i.2005, light tr[ap], A. v. Harten col[lector]”, (UFES). Paratype: 1♂, al-Ajban, 9.xi–7.xii.2005, MT & LT, AvH.

Description: Holotype (Plate 1). Male. Body 1.77 mm. LFW 1.08 mm.

Colouration. Head dark castaneous nearly black; scape dark castaneous; pedicel dark castaneous; flagellum castaneous; mandible dark castaneous with apex lighter; palpi light castaneous; mesosoma dark castaneous nearly black; tegula castaneous; wings sub-hyaline; wing venation castaneous; fore coxa dark castaneous; mid coxa dark castaneous; hind coxa dark castaneous; trochanters dark castaneous; fore femur dark castaneous; mid femur dark castaneous; hind femur dark castaneous; fore tibia dark castaneous; mid tibia dark castaneous; hind tibia dark castaneous; tarsi castaneous; metasoma castaneous.

Head (Plate 3). Head as long as wide, globoid [in lateral view]. Malar space shorter than VOL, parallel. Mandible with three acute apical teeth equally wide, lower margin straight, lower tooth longer than first upper tooth, lower tooth wider than others. Palpi caliciform, flattened. Clypeus with median lobe delimited, quadrate; median clypeal carina arched, complete, straight [in dorsal view], above torulus. Intertorular distance more than torulus diameter. Antenna with conspicuous pubescence, erect, sparse and short; cylindrical shape; scape curved, with same diameter across extension; pedicel longer than wide, fusiform; first flagellomere shorter than pedicel, as long as others; flagellomeres long. Eye small, circular, hairy, contour protuberant. Frons not foveolate; with frontal carina. First five antennal segments in ratio of about 11:7:6:6:6. LH $1.1 \times$ WH. WF $1.44 \times$ HE. WF $0.62 \times$ WH. OOL $0.86 \times$ WOT. VOL $0.55 \times$ HE. Distance of posterior ocellus to vertex crest $1.5 \times$ DAO. Frontal angle of ocellar triangle acute; ocelli small; ocellar triangle not compact, placed at middle of head; ocellar fovea absent. Temple profile divergent anterad. Vertex convex. Its

corner rounded. Hypostomal carina forming obtuse angle. Dorsal half of occipital carina present, low. Ventral half of occipital carina absent.

Mesosoma (Plates 4, 5). Pronotal disc $0.8\times$ as long as wide; anterior slope of pronotum inclined in profile; coriaceous, with anterior corner rounded, trapezoidal, side slightly concave, anterior margin convex, posterior margin straight; longitudinal pronotal furrow absent. Propleuron without epicoxal sulcus. Pleurosternum without epicoxal sulcus. Mesoscutum coriaceous, long; longitudinal mesoscutal furrow absent; notaulus present, complete, convergent posteriorly, deep, wide, polished; parapsidal furrow present, incomplete, shallow, parallel. Axila polished and shallow. Scutoscutellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, arched, not dilated at ends. Scutellum medium, coriaceous, touching propodeal disc. Metanotum overlapping lateral region of scutellum. Propodeal disc $1.0\times$ as long as wide medially; short, with central fovea fused with propodeal triangle fovea, with three carinae; median carina incomplete; without longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina not fused anteriorly; inner discal carina complete; sublateral carina present; lateral carina present; followed by short striae; posterior carina complete; spiracle circular; posterior spines of propodeum absent. Declivity of propodeum coriaceous, without median carina, without lateral carina. Lateral surface of propodeum coriaceous. Mesopleuron coriaceous; with subtegular fovea continuous with episternal furrow; mesopleural sulcus present, foveolate, complete; episternal furrow with inner margin foveolate.

Wings. Tegula separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; basal vein straight; transverse median vein arched; weakly developed, distal margin truncate; radial vein slightly curved forward, originating from distal margin of stigma. Hind wing with costal vein short; with distal hamuli, with three hamuli, first hamulus widely separated from others.

Legs. Foretibia short [$1.5\times$ first tarsomere length], with foretibial spur long [longer than half length of first tarsomere]. Tarsi with tarsomeres I–IV progressively shorter distad, tarsomeres with short distal spines, conical; tarsal claw simple and arched with apex acute, base without tooth, curved ventrad; arolium simple, apex angulate, slender.

Metasoma. Metasoma $2.0\times$ longer than wide; with lap of lateral margin; dorsal region of terga III–VI polished; ventral region of terga III–VI polished; with posterior margin of tergites straight; with sparse setae at posterior margin of terga II–VI; hypopygium (Fig. 1) bilobate with median indentation, with filamentary branch, longer than wide, posterior margin concave, lateral margin convergent, lateral margin slightly concave, anterior corner angulate, with posterior margin unilobate, posterior lobes long.

Genitalia (Fig. 7). Genital ring protruding dorsally, with distal margin rounded and not emarginated. Paramere fully divided into two arms; dorsal arm of paramere shorter than ventral arm, 'S'-shaped, and with basal margin thin; ventral arm of paramere wide at apex; apex glabrous; inner margin concave. Basivolsella fully outlined from basiparamere. Cuspis biramous, with arms distinct; ventral arm aligned with dorsal arm apex, slender, and thick, apex rounded; dorsal arm slender, and with apex rounded. Aedeagus slender, with pair of apical lobes; aedeagus with apex surpassing paramere apex, lobes touching each other; apical margin rounded, apical sickle process short; lateral of margin of basal portion slightly convex. Apodeme parallel, base curved laterad.

Remarks: This species is similar to *A. dalmaticus* (Móczár, 1970) by having the head as long as wide, the clypeus slightly protruding with margin weakly arched, the propodeal disc with three distinct carinae, propodeal spines indistinct. However, *A. simplicitus* nov. spec. has head with frontal carina, vertex straight, propodeum as long as wide and with posterior corner

rounded, propodeal disc concave and with median carina incomplete, whereas *A. dalmaticus* has head with frontal groove, vertex rounded, propodeum wider than long and with posterior corner angled, propodeal disc convex and with median carina complete. This species is the second species of *Anaylax* with known males and the first of which the male genitalia have been described.

Distribution: United Arab Emirates.

Etymology: The specific epithet *simplicitus*, from Latin, refers to the simple characteristics of the new species.

Genus *Clytrovorus* Nagy, 1972

Clytrovorus has six valid species all recorded from the Palaearctic region. Hosts are beetle larvae of *Clytrinae* (Chrysomelidae) (Nagy, 1972).

Nagy (1972) described the genus as having: Head, pronotum and mesopleuron only weakly and superficially punctate but evidently coriaceous; median lobe of clypeus elongate, median carina simple and in a very oblique position, never completely vertical and not reaching the anterior margin of clypeus, the latter with two small impressions laterally and basally; antennae in both sexes thirteen-segmented and with moderately long erect pubescence in male, only slightly thickened medially in female; mandible with three apical teeth, the inferior tooth wider than others; hypostomal and occipital carinae complete, not strongly foveolate; pronotum with an ill-defined longitudinal furrow which is not present on the mesoscutum; notauli and parapsidal furrows of uniform width, the latter inconspicuous in female, mesopleural groove more or less impressed and complete in female, only feebly visible in male, without any carina on sides; propodeum rather convex dorsally, arched laterally in the female and very weakly divergent toward the apex in female, slightly convergent in male, the disc with central and lateral carina present in female and male, median carina not well-defined, inner discal carina lacking and marked by an impression, sublateral carina lacking; known females micropterous, males macropterous with the fore wing without costal vein; second abdominal tergite sparsely punctate, its posterior margin broadly shining.

Clytrovorus exaggeratus Barbosa & Azevedo **nov. spec.**

Plates 2, 6–8, Figures 2, 8

Specimens examined: Holotype: ♂, "UN[ITED] ARAB EMIRATES, Wadi Wurayah, 25.24N 56.17E, 12–14.iv.2005, Malaise & YPT, TP col[lector]" (UFES). Paratypes: 21♂, Wadi Wurayah, 12–14.iv.2005, MT & WT, leg. T. Pape; 1♂, 10–26.xii.2006, MT, AvH. 5♂, Wadi Wurayah farm, 1.iv–14.vi.2009, LT, AvH. 1♂, Wadi Madaq, WT, 7–14.iii.2006, AvH. YEMEN: 1♂, Lahj, 1.iv–17.v.2000, MT, leg. A. van Harten & A. Sallam. 1♂, 12 km NW of Manakhah, 6.vii–21.viii.2002, MT, AvH.

Description: Holotype (Plate 2). Male. Body 2.57 mm. LFW 1.78 mm.

Colouration. Head dark castaneous nearly black; scape dark castaneous; pedicel dark castaneous; flagellum dark castaneous; mandible dark castaneous with apex lighter; palpi light castaneous; mesosoma dark castaneous nearly black; tegula castaneous; wings clear hyaline; wing venation light castaneous; fore coxa dark castaneous; mid coxa dark castaneous; hind coxa dark castaneous; trochanters dark castaneous; fore femur dark castaneous; mid femur castaneous; hind femur castaneous; fore tibia castaneous; mid tibia castaneous; hind tibia castaneous; tarsi light castaneous; metasoma castaneous.

Head (Plate 6). Head wider than long, narrow [in lateral view]. Malar space shorter than VOL, parallel. Mandible with three acute apical teeth, equally wide, lower margin curved, lower tooth longer than immediately upper teeth, lower tooth wider than others. Palpi caliciform, flattened. Clypeus with median lobe delimited, rounded; lateral lobe absent; median clypeal carina straight, incomplete, straight shape [in dorsal view], above torulus.



Plates 1–2. 1: *Anaylax simplicitus* nov. spec., male holotype, habitus; 2: *Clytrovorus exaggerates* nov. spec., male holotype, habitus. Scale = 300µm.

Intertorular distance more than torulus diameter. Antenna with conspicuous pubescence, erect, sparse and short; caliciform; scape curved, with same diameter across extension; pedicel longer than wide, fusiform; first flagellomere as long as pedicel, as long as others; flagellomeres long. Eye small, circular, hairy, contour protuberant. Frons not foveolate. First five antennal segments in ratio of about 20:12:12:12:12. LH $0.93 \times$ WH. WF $1.74 \times$ HE. WF $0.66 \times$ WH. OOL $0.7 \times$ WOT. VOL $0.43 \times$ HE. Distance of posterior ocellus to vertex crest $2.0 \times$ DAO. Frontal angle of ocellar triangle obtuse; ocelli large; ocellar triangle not compact, placed at posterior half of head; ocellar fovea absent. Temple profile divergent anterad. Vertex convex. Its corner rounded. Hypostomal carina straight, forming acute angle medially. Dorsal half of occipital carina present, high, with side strigate. Ventral half of occipital carina present, incomplete, low.

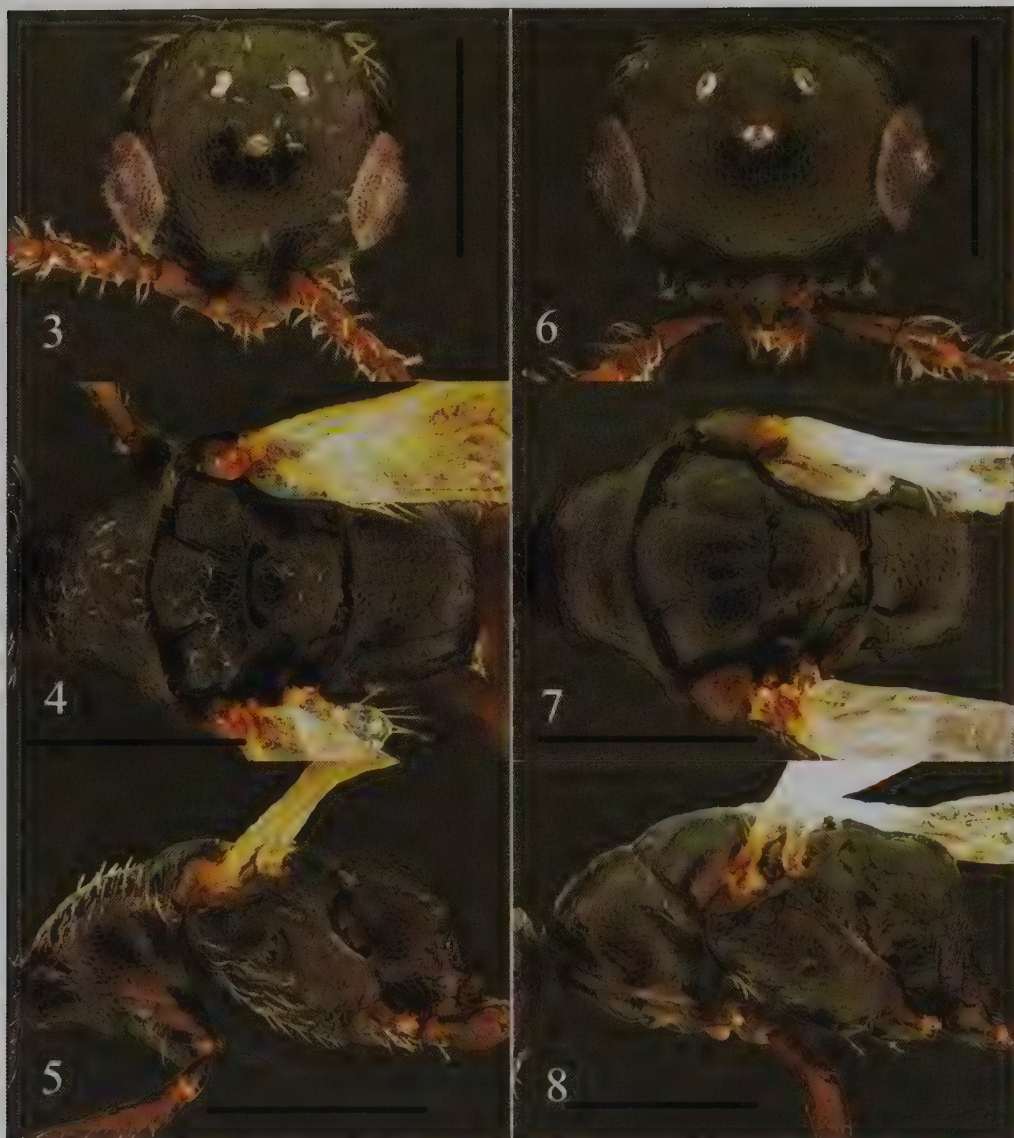
Mesosoma (Plates 7, 8). Pronotal disc $0.75 \times$ as long as wide; anterior slope of pronotum inclined in profile; plate not foveolate; plate groove absent; coriaceous, with anterior corner rounded, trapezoidal, side straight, anterior margin convex, posterior margin concave; longitudinal pronotal furrow absent. Propleuron with epicoxal sulcus, shallow, polished. Pleurosternum without epicoxal sulcus. Mesoscutum coriaceous, long; longitudinal mesoscutal furrow absent; notaulus present, complete, convergent posteriorly, deep, narrow, polished; parapsidal furrow present, incomplete, shallow, parallel. Axila polished and deep. Scutoscutellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, straight, dilated at ends. Scutellum long, coriaceous, not touching propodeal disc. Metanotum overlapping lateral region of scutellum. Propodeal disc $1.0 \times$ as long as wide medially; short, with central fovea not fused with propodeal triangle fovea, with three carinae; median carina complete; without longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina fused anteriorly; inner discal carina incomplete; sublateral carina absent; lateral carina present; followed by short striae; posterior carina complete; spiracle circular; posterior spininess of propodeum absent. Declivity of propodeum weakly strigulate, without median carina, without lateral carina. Lateral surface of propodeum weakly strigate. Mesopleuron coriaceous; with subtegular fovea continuous with episternal furrow; mesopleural sulcus present, foveolate, complete; episternal furrow with inner margin striate.

Wings. Tegula not separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; costal vein absent; basal vein straight; transverse median vein arched; weakly developed, distal margin truncate; radial vein slightly curved forward, originating from distal margin of stigma. Hind wing with costal vein short; with distal hamuli, with three hamuli, first hamulus widely separated from others.

Legs. Foretibia short [$1.5 \times$ first tarsomere length], with foretibial spur long [longer than half length of first tarsomere]. Tarsi with tarsomeres I–IV progressively shorter distad, tarsomeres with short distal spines, conical; tarsal claw simple and arched with apex acute, base without tooth, curved mesad; arolium simple, apex angulate, large.

Metasoma. Metasoma $2.0 \times$ longer than wide; tergum I ventral region polished, with lap of lateral margin; dorsal region polished, ventral region polished; dorsal region of terga III–VI polished; ventral region of terga III–VI polished; with posterior margin of tergites straight; with sparse setae at posterior margin of terga II–VI; hypopygium (Fig. 2) bilobate with median indentation, with lobate branch, longer than wide, posterior margin slightly concave, lateral margin convergent, lateral margin straight, anterior corner indented, lateral projection posteriorly short, with posterior margin unilobate, posterior lobes short.

Genitalia (Fig. 8). Genital ring protruding dorsally, with distal margin rounded and emarginated. Paramere fully divided into two arms; dorsal arm of paramere shorter than



Plates 3–8. 3–5. *Anaylax simplicitus* nov. spec., holotype. 3: Head in dorsal view; 4: Mesosoma in dorsal view; 5: Mesosoma in lateral view. 6–8. *Clytrovorus exaggerates* nov. spec., holotype. 6: Head in dorsal view; 7: Mesosoma in dorsal view; 8: Mesosoma in lateral view. Scale = 300µm.

ventral arm, club-shaped, and with basal margin thin; ventral arm of paramere slender; apex sparsely hairy; inner margin concave. Basivolsella fully outlined from basiparamere, with sparse line of hairs. Cuspis biramous, with arms distinct; ventral arm aligned with dorsal arm apex, slender, and thin, apex rounded; dorsal arm slender, and with apex rounded. Aedeagus slender, with pair of apical lobes; with apex not reaching paramere apex, lobes touching each

other; apical margin truncate, apical sickle process absent; lateral of margin of basal portion straight. Apodeme parallel, base straight.

Variation. Body 2.21–3.82 mm; length of fore wing 1.46–2.21 mm; mesopleuron with mesopleural sulcus incomplete and weak; metasoma with median carina of tergum I present.

Remarks: This species is similar to *C. horvathi* (Kieffer, 1906) by having the median clypeal lobe rounded, the antenna with first flagellomere as long as pedicel, the dorsal half of occipital carina high and strigate and the scutellum with scutellar groove narrow. However, *C. exaggeratus* nov. spec. has the frons coriaceous, the pronotal disc without longitudinal furrow, the ocellar triangle obtuse, the scutellum with scutellar groove straight and with apex dilated, the propodeal disc with median and inner discal carina incomplete and the propodeum without posterior spiness, whereas *C. horvathi* has the frons weakly foveolate, the pronotal disc with longitudinal furrow, the ocellar triangle right, the scutellum with scutellar groove arched and without apex dilated, the propodeal disc with median and inner discal carina complete and the propodeum with posterior spiness very short.

Distribution: United Arab Emirates and Yemen.

Etymology: The specific epithet *exaggeratus*, from Latin, refers to the great width of the head.

Genus *Heterocoelia* Dahlbom, 1854

Heterocoelia has 32 valid species of which seven have been recorded from the Afrotropical region, 20 from the Palearctic region and five from the Oriental region. No hosts have yet been recorded for this genus.

The original description provided by Dahlbom (1854) does not permit its precise identification. However, Móczár (1971) improved the description, defining the genus as having: Head and pronotum often densely and coarsely punctured, in very small and completely black species head and pronotum being rarely coriaceous; flagellar segments not thickened medially and segments 2–3 (♂) with either nearly equal or with different length and with short proclinate hairs; pronotum with longitudinal furrow; mesonotum and scutellum sparsely punctured, in males mostly coriaceous, and only weakly shining, with rarely a shallow and broader longitudinal impression; lateral spines of propodeum never long, mostly obtuse in lateral view; male with fully developed and female with normal or shortened wings; tergites usually distinctly, sometimes densely punctured.

Heterocoelia finus Barbosa & Azevedo nov. spec.

Plates 9, 11–13

Specimens examined: Holotype: ♀, "YEMEN, Lahj, VIII.2002, Malaise trap, A. v. Harten & A. Sallam col[lector]", (CNCI). Paratype: 1♀, Lahj, 17.xi.2001–31.i.2002, MT, leg. A. van Harten & A. Sallam.

Description: Holotype (Plate 9). Female. Body 4.97 mm. LFW 2.18 mm.

Colouration. Head castaneous; scape castaneous; pedicel castaneous; flagellum dark castaneous with first flagellomere castaneous; mandible castaneous; palpi dark castaneous; mesosoma castaneous; tegula castaneous; wings twice-banded; wing venation dark castaneous; fore coxa castaneous; mid coxa castaneous; hind coxa castaneous; trochanters castaneous; fore femur castaneous; mid femur castaneous; hind femur castaneous; fore tibia castaneous; mid tibia castaneous; hind tibia castaneous; tarsi castaneous; metasoma dark castaneous nearly black.

Head (Plate 11). Head longer than wide, narrow [in lateral view]. Malar space longer than VOL, parallel. Mandible with three acute apical teeth, equally wide, lower margin straight, lower tooth longer than immediately upper teeth, lower tooth wider than others. Palpi caliciform, flattened. Clypeus with median lobe distinct, rounded; lateral lobe present, shorter

than median lobe; median clypeal carina straight, complete, straight shape [in dorsal view], below torulus. Intertorular distance less than torulus diameter. Antenna with conspicuous pubescence, pubescence sub-erect, pubescence dense, pubescence short; cylindrical shape; scape slightly curved, with same diameter across extension; pedicel longer than wide, rectangular; first flagellomere longer than pedicel, longer than others; flagellomeres short. Eye small, oval, glabrous, contour protuberant. Frons strongly foveolate. First five antennal segments in ratio of about 35:12:15:10:10. LH $1.08 \times$ WH. WF $1.34 \times$ HE. WF $0.58 \times$ WH. OOL $1.12 \times$ WOT. VOL $0.16 \times$ HE. Distance of posterior ocellus to vertex crest $4.5 \times$ DAO. Frontal angle of ocellar triangle obtuse; ocelli small; ocellar triangle not compact, placed at posterior half of head; ocellar fovea absent. Temple profile divergent anterad. Vertex convex. Its corner rounded. Hypostomal carina straight, forming acute angle medially. Dorsal half of occipital carina present, high, with side strigate. Ventral half of occipital carina present, complete, high, with side strigate.

Mesosoma (Plates 12, 13). Pronotal disc $0.77 \times$ as long as wide; anterior slope of pronotum inclined in profile; plate foveolate; plate groove absent; foveolate, with anterior corner angled, trapezoidal, side straight, anterior margin convex, posterior margin sinuous; longitudinal pronotal furrow present, complete, shallow. Propleuron without epicoxal sulcus. Pleurosternum without epicoxal sulcus. Mesoscutum coriaceous, short; longitudinal mesoscutal furrow incomplete; notaulus present, complete, convergent posteriorly, deep, narrow, polished; parapsidal furrow present, incomplete, deep, parallel. Axila strigate and deep. Scutoscuteellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, straight, dilated at ends. Scutellum short, coriaceous, touching propodeal disc. Metanotum overlapping lateral region of scutellum. Propodeal disc $0.52 \times$ as long as wide medially; short, with central fovea fused with propodeal triangle fovea, with three carinae; median carina complete; with longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina fused anteriorly; inner discal carina complete; sublateral carina present; lateral carina present; followed by short striae; posterior carina complete; spiracle circular; posterior spininess of propodeum present, short, thin, divergent. Declivity of propodeum areolate, with median carina, with lateral carina. Lateral surface of propodeum areolate, with upper carina. Mesopleuron foveolate; with subtegular fovea continuous with episternal furrow; mesopleural sulcus present, foveolate, complete; episternal furrow with inner margin foveolate.

Wings. Tegula separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; basal vein angulate; transverse median vein biangulate; weakly developed, distal margin truncate; radial vein slightly curved forward, originating from distal margin of stigma. Hind wing with costal vein short; with distal hamuli, with three hamuli, first hamulus widely separated from others.

Legs. Foretibia short [$1.5 \times$ first tarsomere length], with foretibial spur short [shorter than half length of first tarsomere]. Hind coxa with dorsal spine. Tarsi with tarsomeres I–IV progressively shorter distad, tarsomeres with long distal spines, conical; tarsal claw simple and arched with apex acute, base without tooth, curved ventrad; arolium simple, apex straight, slender.

Metasoma. Metasoma $2.8 \times$ longer than wide; tergum I ventral region strigate, with lap of lateral margin, with lateral pilosity; dorsal region punctured, with lateral pilosity, ventral region punctured; dorsal region of terga III–VI polished; ventral region of terga III–VI polished; with posterior margin of tergites straight; with sparse setae at posterior margin of terga II–VI.

Variation. Sometimes the mesonotum has the longitudinal furrow indistinct, the lateral surface of propodeum without superior carina.

Remarks: This species is similar to *H. braunsi* (Kieffer, 1911) by having the mesosoma and propodeum entirely yellowish red, the head and the abdomen dark castaneous, nearly black, the antenna with scape longer than pedicel and first flagellomere, the frons without frontal furrow, the pronotum densely punctured, the mesonotum with weak longitudinal furrow, the propodeum with lateral spine short and with lateral sides distinctly divergent, the forewing long reaching to tergum II and twice-banded, the metasoma with tergum II only with weak and sparse punctures. However, *H. finus* nov. spec. has the scutellar groove not dilated at extremity, the propodeal disc with sublateral and inner discal carina not fused at origin, the posterior spines of propodeum short and slender, whereas *H. braunsi* has the scutellar groove dilated at extremity, the propodeal disc with sublateral and inner discal carina fused at origin, the posterior spines of propodeum stumpy and strong.

Distribution: Yemen.

Etymology: The specific epithet *finus* is an arbitrary letters combination. The suffix 'us' to indicate masculine gender.

Genus *Mesitius* Spinola, 1853

Mesitius has 15 valid species all recorded from the Palaearctic region. No hosts have yet been recorded for this genus.

Spinola (1853) described the genus, but his description is not clear, therefore we follow the genus description of Móczár (1970) who defined the genus as having: Head long, oval, either rounded (♂) or round (♀), mostly finely coriaceous and only superficially punctured (♂) or deeply punctured (♀), matt, hardly shining; ocelli distinct; longitudinal keel of clypeus spoon-like dilated (♂, ♀); antennal segments short or slender, not thickened medially (♂) or with nearly equal length of segments 2–8 (♀); pronotum smooth, coriaceous at most finely and only superficially punctured, longitudinal furrow distinct, usually rather deep, only in rare cases weakly developed (as in *M. spathulifer* Picard, 1932); mesonotum smooth, without longitudinal furrow medially, mostly matt, hardly sculptured, with distinct notauli and parapsidal furrows; propodeum rather long, when sometimes conspicuously convex, then lateral spines situated distinctly below the level of disc proximally, surface often weakly sculptured, lateral angles with moderate, often stumpy spines, longitudinal carinae distinct, as well as sublateral ones, carinae sometimes only weakly developed; abdominal tergite 2 shining, only finely punctured.

Mesitius absentis Barbosa & Azevedo nov. spec.

Plates 10, 14–16

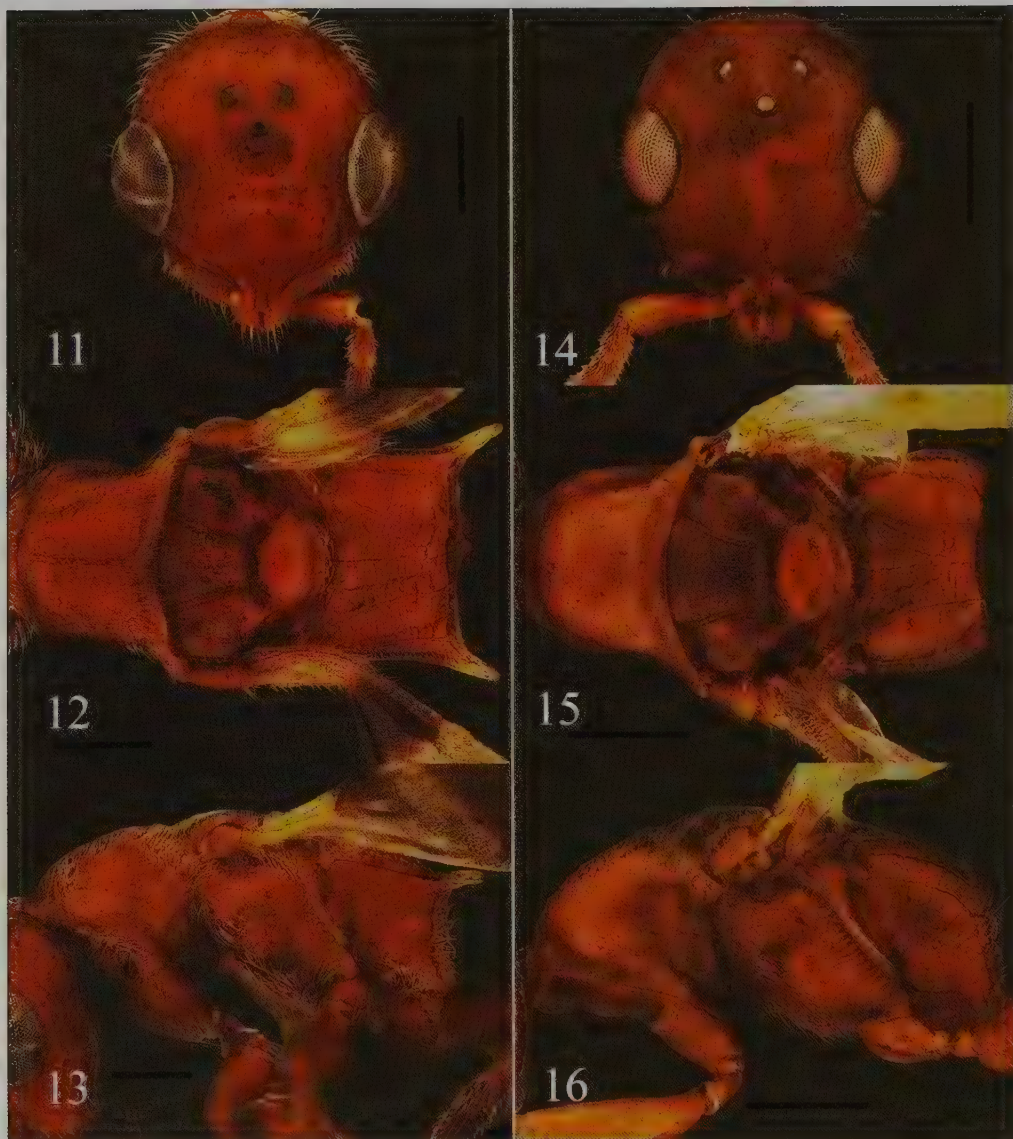
Specimens examined: Holotype: ♀, "UN[ITED] ARAB EMIRATES, Al-Ajban, 24.36N 55.01E, 22.x–9.xi.2005, Mal[aise] trap, A.v. Harten col[lector]" (UFES). Paratypes: 1♀, al-Ajban, 22.x–9.xi.2005, MT, AvH. 1♀, Wadi Madaq, 26.x–09.xi.2006, WT, AvH. 1♀, Wadi Wurayah, 12–14.iv.2005, MT & WT, leg. T. Pape; 1♀, 10–26.xii.2006, MT, AvH. 2♀, Wadi Wurayah farm, 1.iv–14.vi.2009, LT, AvH. Description: Holotype (Plate 10). Female. Body 6.07 mm. LFW 2.86 mm.

Colouration. Head castaneous; scape light castaneous; pedicel light castaneous; flagellum castaneous; mandible light castaneous; palpi light castaneous; mesosoma castaneous; tegula castaneous; wings sub-hyaline with distal spot; wing venation castaneous; fore coxa light castaneous; mid coxa light castaneous; hind coxa light castaneous; trochanters light castaneous; fore femur light castaneous; mid femur light castaneous; hind femur light castaneous; fore tibia light castaneous; mid tibia light castaneous; hind tibia light castaneous; tarsi light castaneous; metasoma dark castaneous.



Plates 9–10. 9: *Heterocoelia finus* nov. spec., female holotype, habitus; 10: *Mesitius absentis* nov. spec., female holotype, habitus. Scale = 300µm.

Head (Plate 14). Head longer than wide, globoid [in lateral view]. Malar space longer than VOL, convergent anteriorly. Mandible with three acute apical teeth, equally wide, lower margin straight, lower tooth longer than immediately upper teeth, lower tooth wider than lobe others. Palpi caliciform, flattened. Clypeus with median lobe distinct, quadrate; lateral absent; median clypeal carina inclined, incomplete, spoon-like shape in dorsal view, at same level of torulus. Intertorular distance less than torulus diameter. Antenna with inconspicuous pubescence, sub-erect, dense and short; cylindrical shape; scape slightly curved, with same diameter across extension; pedicel longer than wide, rectangular; first flagellomere as long as pedicel, longer than others; flagellomeres short. Eye small, circular, hairy, contour protuberant. Frons strongly foveolate. First five antennal segments in ratio of about 25:11:11:6:6. LH $1.15 \times$ WH. WF $1.55 \times$ HE. WF $0.61 \times$ WH. OOL $1.0 \times$ WOT. VOL $0.42 \times$ HE. Distance of posterior ocellus to vertex crest $2.0 \times$ DAO. Frontal angle of ocellar triangle obtuse; ocelli small; ocellar triangle not compact, placed at posterior half of head; ocellar fovea present, narrow. Temple profile divergent anterad. Vertex convex. Its corner rounded. Hypostomal carina straight, forming acute angle medially. Dorsal half of occipital carina present, high, with side foveolate. Ventral half of occipital carina present, incomplete, high. Mesosoma (Plates 15, 16). Pronotal disc $1.0 \times$ as long as wide; anterior slope of pronotum inclined in profile; plate not foveolate; coriaceous, with anterior corner rounded, trapezoidal, side straight, anterior margin convex, posterior margin concave; longitudinal pronotal furrow present, complete, shallow. Propleuron with epicoxal sulcus, deep, polished. Pleurosternum with epicoxal sulcus, foveolate. Mesoscutum coriaceous, long; longitudinal mesoscutal furrow absent; notaulus present, complete, convergent posteriorly, deep, wide, polished; parapsidal furrow present, incomplete, shallow, parallel. Axila polished and deep. Scutoscuteellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, arched, dilated at ends. Scutellum coriaceous, not touching propodeal disc. Metanotum overlapping lateral region of scutellum. Propodeal disc $0.63 \times$ as long as wide medially; short, with central fovea fused with propodeal triangle fovea, with three carinae; median carina complete; with longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina not fused anteriorly; inner discal carina complete; sublateral carina present; lateral carina present; followed by short striae; posterior carina complete; spiracle elliptical; posterior spiness of propodeum absent. Declivity of propodeum foveolate, without median carina, with lateral carina. Lateral surface of propodeum foveolate. Mesopleuron foveolate; with subtegular fovea continuous with episternal furrow; mesopleural sulcus present, foveolate, complete; episternal furrow with inner margin striate. Wings. Tegula separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; basal vein straight; transverse median vein arched; weakly developed, distal margin truncate; radial vein slightly curved forward, originating from distal margin of stigma. Hind wing with costal vein short; with distal hamuli, with three hamuli, first hamulus widely separated from others. Legs. Foretibia short [$1.5 \times$ first tarsomere length], with foretibial spur short [shorter than half length of first tarsomere]. Tarsi with tarsomeres I–IV progressively shorter distad, tarsomeres with short distal spines, cylindrical; tarsal claw simple and arched with apex acute, base with only strong tooth, curved ventrad; arolium simple, apex angulate, slender. Metasoma. Metasoma $3.16 \times$ longer than wide; tergum I ventral region polished, with lap of lateral margin; dorsal region polished, ventral region polished; dorsal region of terga III–VI polished; ventral region of terga III–VI polished; with posterior margin of tergites toothed; with sparse setae at posterior margin of terga II–VI.



Plates 11–16. 11–13. *Heterocoelia finus* nov. spec., holotype. 11: Head in dorsal view; 12: Mesosoma in dorsal view; 13: Mesosoma in lateral view. 14–16. *Mesitius absentis* nov. spec., holotype. 14: Head in dorsal view; 15: Mesosoma in dorsal view; 16: Mesosoma in lateral view. Scale = 300µm.

Variation. Body length 4.46–6.07 mm; Length of fore wing 1.89–2.86 mm; weak callus at anterior corner of pronotal disc; declivity of propodeum with weak median carina.

Remarks: This species is similar to *M. judaeorum* (Picard, 1932) by having the head longer than wide, the eyes and ocelli small, the pronotum with longitudinal furrow complete and weak, and the forewing twice-banded. However, *M. absentis* nov. spec. has the propodeum

without spines at posterior corners, whereas *M. judaeorum* has the propodeum with spines at posterior corners.

Distribution: United Arab Emirates.

Etymology: The specific epithet *absentis*, from Latin, refers to the absence of a posterior spine of the propodeum.

Genus *Metrionotus* Móczár, 1970

Metrionotus has 28 valid species of which 17 have been recorded from the Afrotropical region, seven from the Palaearctic region and four from the Oriental region. No hosts have yet been recorded for this genus.

Móczár (1970) described the genus as having: Head, pronotum, mesonotum, scutellum coriaceous, sometimes finely granulate only with superficially and at most with scattered punctures, at times on some males (with erect hairs) with some deeper punctures; ocelli distinct; clypeus protruding and with an acute keel longitudinally; antenna not thickened medially (♀), slender and either the proximal flagellar segments with narrower base and broadened tip, with sparse and long erect hairs, hairs of flagellum distinctly shorter than breadth of segments and proclinate; pronotum weakly shining with distinct longitudinal furrow medially, but on some male specimens only proximally or medially developed, posterior margin not protruding medially; mesonotum without a longitudinal furrow, but with parapsidal furrows and notauli; propodeum with distinct carinae and well separated areas, they are developed sometimes only weakly, also sublateral carinae present, lateral angles only with hardly any (♂) or with moderate (♀) spines; metasoma with tergite II polished only with fine scattered punctures (♀) or smooth entirely shining or partly coriaceous indistinctly or very finely punctured.

Metrionotus carbonarius Móczár, 1970

Plate 17, Figures 3, 9

Specimens examined: Al-Ajban, 1♂, 28.xii.2005–26.ii.2006, Malaise trap, AvH; 1♂, 1.iv–2.v.2006, Malaise trap, AvH.

Description: Hypopygium (Fig. 3). Hypopygium bilobate with median indentation, with filamentary branch, as long as wide, posterior margin concave, lateral margin convergent, lateral margin slightly concave, anterior corner indented, lateral projection posteriorly short, with posterior margin unilobate, posterior lobes short.

Genitalia (Fig. 9). Genital ring protruding dorsally, with distal margin rounded and not emarginated. Paramere fully divided into two arms; dorsal arm of paramere as long as ventral arm, 'S'-shaped, and with basal margin thin; ventral arm of paramere slender; apex sparse hairy; inner margin concave. Basivolsella fully outlined from basiparamere. Cuspis biramous, with arms slightly indistinct; ventral arm aligned with dorsal arm apex, slender, and thick, apex rounded; dorsal arm slender, and with apex rounded. Aedeagus slender, with pair of apical lobes; with apex aligned with paramere apex, lobes touching each other; apical margin rounded with sickle process, apical sickle process absent; margin of basal portion laterally convex. Apodeme divergent, base curved laterad.

Remarks: In the original description (Móczár, 1970), the male genitalia were not described and illustrated, therefore we describe and illustrate them here.

Distribution: Hungary, Republic of South Africa and UAE. This is the first record of this species from Arabian Peninsula. Like *M. szelenyii* (Móczár, 1970), this species is recorded both from South Africa and Arabian Peninsula.

***Metrionotus indistinctus* Barbosa & Azevedo nov. spec.**

Plates 18–21, Figures 4, 10

Specimens examined: Holotype: ♂, "YEMEN, Lahj, 17.V–15.V.2001, Malaise trap, A. van Harten & A. Sallam col[lector]" (CNCI). Paratype: 1♂, Lahj, ix.2000, MT, leg. A. van Harten & A. Sallam.

Description: Holotype (Plate 18). Male. Body 3.18 mm. LFW 1.84 mm.

Colouration. Head castaneous; scape light castaneous; pedicel light castaneous; flagellum light castaneous; mandible light castaneous; palpi light castaneous; mesosoma castaneous; tegula castaneous; wings twice-banded; wing venation light castaneous; fore coxa castaneous; mid coxa castaneous; hind coxa castaneous; trochanters castaneous; fore femur castaneous; mid femur dark castaneous; hind femur dark castaneous; fore tibia castaneous; mid tibia dark castaneous; hind tibia dark castaneous; tarsi light castaneous; metasoma dark castaneous nearly black.

Head (Plate 19). Head longer than wide, narrow [in lateral view]. Malar space shorter than VOL, parallel. Mandible with three acute apical teeth, equally wide, lower margin straight, lower tooth longer than upper teeth, lower tooth wider than others. Palpi rectangular, cylindrical. Clypeus with median lobe delimited, rounded; lateral lobe present, shorter than median lobe; median clypeal carina straight, complete, straight shape [in dorsal view], below torulus. Intertorular distance more than torulus diameter. Antenna cylindrical in shape with conspicuous erect, dense, short pubescence; scape curved, with same diameter across extension; pedicel longer than wide, caliciform; first flagellomere as long as pedicel, as long as others; flagellomeres long. Eye small, circular, glabrous, contour protuberant. Frons strongly foveolate; with frontal sulcus. First five antennal segments in ratio of about 20:15:15:15:15. LH $1.11 \times$ WH. WF $1.58 \times$ HE. WF $0.58 \times$ WH. OOL $0.81 \times$ WOT. VOL $0.29 \times$ HE. Distance of posterior ocellus to vertex crest $3.0 \times$ DAO. Ocellar triangle frontally right-angled; ocelli small; ocellar triangle not compact, placed at middle of head; ocellar fovea present, narrow. Temple profile divergent anterad. Vertex straight, its corner angled. Hypostomal carina forming obtuse angle. Dorsal half of occipital carina present, high, with side strigate. Ventral half of occipital carina present, complete, high, with side strigate.

Mesosoma (Plates 20, 21). Pronotal disc $0.76 \times$ as long as wide; anterior slope of pronotum straight; plate not foveolate; plate groove present, foveolate, with anterior corner rounded, trapezoidal, side straight, anterior margin convex, posterior margin concave; longitudinal pronotal furrow present, complete, deep. Propleuron with epicoxal sulcus, shallow, polished. Mesoscutum coriaceous, long; longitudinal mesoscutal furrow absent; notaulus present, complete, convergent posteriorly, deep, narrow, polished; parapsidal furrow present, incomplete, shallow, parallel. Axila polished and shallow. Scutoscutellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, straight, dilated at ends. Scutellum coriaceous, touching propodeal disc. Metanotum overlapping lateral region of scutellum. Propodeal disc $0.48 \times$ as long as wide medially; short, with central fovea fused with propodeal triangle fovea, with three carinae; median carina complete; with longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina fused anteriorly; inner discal carina complete; sublateral carina present; lateral carina present; followed by short striae; posterior carina complete; spiracle elliptical; posterior spines of propodeum present, short, thin, divergent. Declivity of propodeum areolate, with median carina, with lateral carina. Lateral surface of propodeum strigate, with upper carina, with posterior carina. Mesopleuron weakly foveolate and strigate at episternal furrow region; with subtegular fovea continuous with episternal furrow; mesopleural sulcus present, foveolate, complete; episternal furrow with inner margin foveolate.

Wings. Tegula separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; basal vein straight; transverse



Plates 17–18. 17. *Metrionotus carbonarius* Móczár, male, habitus; 18. *Metrionotus indistinctus* nov. spec., male holotype, habitus. Scale = 300µm.

median vein arched, weakly developed, distal margin convex; radial vein slightly curved forward, originating from distal margin of stigma. Hind wing with costal vein short; with distal hamuli, with three hamuli, first hamulus widely separated from others.

Legs. Foretibia short [$1.5 \times$ first tarsomere length], with foretibial spur long [longer than half length of first tarsomere]. Hind coxa with dorsal spine. Tarsi with tarsomeres I–IV progressively shorter distad, tarsomeres without distal spines, cylindrical; tarsal claw simple and arched with apex acute, base without tooth, curved ventrad; arolium simple, apex angulate, large.

Metasoma. Metasoma $1.76 \times$ longer than wide; tergum I ventral region polished, with lap of lateral margin, without lateral pilosity; dorsal region polished, without lateral pilosity, ventral region polished; dorsal region of terga III–VI polished; ventral region of terga III–VI polished; with posterior margin of tergites straight; with sparse setae at posterior margin of terga II–VI; hypopygium (Fig. 4) bilobate with median indentation, with lobate branch, longer than wide, posterior margin slightly concave, lateral margin convergent, lateral margin straight, anterior corner angulate, with posterior margin unilobate, posterior lobes short.

Genitalia (Fig. 10). Genital ring protruding dorsally, with distal margin rounded and emarginated. Paramere fully divided into two arms; dorsal arm of paramere as long as ventral arm, club-shaped, and with basal margin thin; ventral arm of paramere wide at apex; apex sparsely hairy; inner margin straight. Basivolsella fully outlined from basiparamere, with sparse line of hairs. Cusps biramous, with arms slightly indistinct; ventral arm surpassing dorsal arm apex, slender, and thick, apex rounded; dorsal arm wide, and with apex rounded. Aedeagus slender, with pair of apical lobes; with apex aligned with paramere apex, lobes touching each other; apical margin rounded, apical sickle process absent; lateral of margin of basal portion straight. Apodeme parallel, base with outer margin excavated.

Remarks: This species is similar to *M. wolfi* Móczár, 1970, by having the head slightly longer than wide, the antenna with first flagellomere as long as the other segments, the clypeus protruding and rounded, the frons with frontal sulcus indistinct, the occipital carina high, the pronotum with sides concave, the mesoscutum with longitudinal furrow deep, the scutellum with scutellar groove dilated at extremity, the propodeum with posterior spines stumpy. However, *M. indistintus* nov. spec. has the antenna with pedicel as long as first flagellomere, the frons strongly foveolate, the ocellar fovea shallow, the pronotum with longitudinal furrow shallow, the propodeum with carinae well developed. *M. wolfi* has the antenna with pedicel shorter than first flagellomere, the frons weakly foveolate, the ocellar fovea deep, the pronotum with longitudinal furrow deep, the propodeum with carinae weakly developed.

Distribution: Yemen.

Etymology: The specific epithet *indistintus*, from Latin, refers to the genitalia with the arms of cusps slightly indistinct.

Metrionotus minutissimus (Móczár, 1971)

Plate 22, Figures 5, 11

Specimens examined: Al-Ajban, 1♂, 22.x–9.xi.2005, MT, AvH; 2♂, 9.xi–7.xii.2005, MT & LT, AvH; 1♂, 26.ii–4.iv.2006, MT, AvH; 1♂, 12–19.vi.2006, MT, AvH; 1♂, 27.v–26.vi.2006, MT, AvH; 1♂, 1♂, 26.vi–25.vii.2006, MT, AvH. Fujairah, 1♂, 6.iv–2.v.2005, LT, AvH. Sharjah, 1♂, 28.vi–23.viii.2005, LT, AvH. Wadi Bih dam, 1♂, 7–13.v.2007, LT, AvH; 2♂, 9–23.vii.2008, LT, AvH. Wadi Madaq, 1♂, 20.xii.2005–2.iii.2006, LT, AvH. Wadi Safad, 1♂, 26.xii.2005–2.i.2006, WT, AvH. Wadi Shawkah, 1♂, 9.iv–24.vi.2007, WT, AvH. Wadi Wurayah, 2♂, 12–14.iv.2005, MT & WT, leg. T. Pape.

Hypopygium (Fig. 5). Hypopygium bilobate with median indentation, with lobate branch, longer than wide, posterior margin slightly concave, lateral margin convergent, lateral margin slightly concave, anterior corner indented, lateral projection posteriorly long, with posterior margin unilobate, posterior lobes long.



Plates 19–21. *Metrionotus indistinctus* nov. spec., holotype. 19: Head in dorsal view; 20: Mesosoma in dorsal view; 21: Mesosoma in lateral view. Scale = 300µm.

Genitalia (Fig. 11). Genital ring protruding dorsally, with distal margin rounded and not emarginated. Paramere fully divided into two arms; dorsal arm of paramere as long as ventral arm, club-shaped, and with basal margin thin; ventral arm of paramere wide at apex; apex sparse hairy; inner margin concave. Basivolsella fully outlined from basiparamere, with sparse line of hairs. Cuspis biramous, with arms distinct; ventral arm not reaching dorsal arm apex, slender, and bilobate, apex rounded; dorsal arm slender, and with apex rounded. Aedeagus wide, with pair of apical lobes, with apex aligned with paramere apex; lobes not touching each other; apical margin rounded, apical sickle process absent; lateral of margin of basal portion convex. Apodeme parallel, base with outer margin excavated.

Variation. Head dark castaneous or castaneous, forewing twice-banded; median lobe of clypeus slightly angled, propodeal disc with median carina incomplete, sublateral carina inconspicuous and without spines.

Remarks: In the original description (Móczár, 1971) the male genitalia were not described and illustrated, therefore in this work we describe and illustrate them.

Distribution: Republic of South Africa and United Arab Emirates. This is the first record from Arabian Peninsula of this species. Like *M. szelenii* (Móczár, 1970), this species is recorded both from South Africa and the Arabian Peninsula.

***Metrionotus yarrowi* Móczár, 1970**

Plate 23

Specimens examined: Al-Ajban, 3♀, 22.x–9.xi.2005, MT, AvH; 1♀, 9.xi–7.xii.2005, LT & MT, AvH; 2♀, 1.iv–2.v.2006, MT, AvH; 1♀, 12–19.vi.2006, MT, AvH; 1♀, 26.vi–25.vii.2006, MT, AvH. Sharjah, 1♀, 1–31.i.2005, LT, AvH. Sharjah Desert Park, 1♀, 14.x.2004, at light, AvH; 1♀, 30.iv–31.v.2005, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♀, 28.iii–14.vi.2006, LT, AvH. Wadi Bih dam, 2♀, 24–29.vi.2008, LT, AvH. Wadi Madaq, 1♀, 20.i–3.ii.2006, WT, AvH. Wadi Wurayah, 3♀, 12–14.iv.2005, MT & WT, leg. T. Pape; 1♀, 18.iii–2.iv.2007, MT, AvH. Wadi Wurayah farm, 3♀, 1.iv–14.vi.2009, LT, AvH. YEMEN: Al-Lahima, 3♀, 1.i–9.iv.2001, MT, AvH. Lahj, 1♀, vii–ix.2001, MT, leg. A. van Harten & A. Sallam. 12 km NW of Manakha, 4♀, 3.vii–21.viii.2001, MT, AvH; 1♀, 27.iii–5.v.2002, MT, AvH. Ar-Rujum, 1♀, 15.i–9.iv.2001, MT, AvH; 1♀, 9.iv–5.vi.2001, MT, AvH. Sana'a, 1♀, xii.2002, MT, AvH.

Description: Head dark castaneous or light castaneous, mesosoma light castaneous, mesosoma with median region dark castaneous, metasoma dark castaneous, clypeus slightly slender and less projected; ocelli rather large; median carina of pronotal disc slightly weakly; propodeal disc $1.5 \times$ wider than long.

Distribution: Republic of South Africa and United Arab Emirates. This is the first record of this species from the Arabian Peninsula. Like *M. szelenii* (Móczár, 1970), this species is recorded both from South Africa and the Arabian Peninsula.

Genus *Sulcomesitius* Móczár, 1970

Sulcomesitius has 82 valid species all recorded from the Afrotropical and Oriental regions. No hosts have been recorded for this genus yet.

Móczár (1970) described the genus as having: Head, pronotum coarsely rugose or deeply and densely punctured; antennal segments mostly weakly, sometimes remarkably thickened medially, antennal segments of male slender, either with narrower base and broadened tip which is rounded or truncate, sometimes with slightly concave side ventrally and with extremely long, erect hairs sparsely, or with parallel sides and densely covered with short and proclinate hairs; clypeus remarkably protruding with a sharp raised carina longitudinally; ocelli distinct; pronotum with distinct longitudinal furrow, exceptionally on males weakly developed but distinct, hind margin straight, slightly arched or sometimes protruding medially; mesonotum with distinct longitudinal furrow medially, only on some male less distinct but always present at least as some shining pits; mesonotum smooth or deeply punctured, only weakly shining with distinct parapsidal furrows and notauli and well separated from scutellum by transversal groove, which broadened laterally; propodeum with extremely long lateral spines, spines sometimes as long as length of propodeum in the middle, partly with shorter spines, carina and areas well distinct, sublateral carina also present; abdominal tergite II usually distinctly punctured, covered mostly with scattered light hairs, sometimes with a distinct row of white tuft of hairs.

***Sulcomesitius richardsi* Móczár, 1970**

Plate 24

Specimens examined: YEMEN: Ar-Rujum, 1♀, 9.iv–5.vi.2001, MT, AvH.

Distribution: Malawi and Yemen (new record). This is the first record from the Arabian Peninsula of this species. Like *M. szelenii* (Móczár, 1970), this species is recorded both from Africa and the Arabian Peninsula.

***Sulcomesitius vanharteni* Barbosa & Azevedo nov. spec.**

Plates 25–32, Figures 6, 12

Specimens examined: Holotype: ♂, “YEMEN, Lahj, IX.2000, Malaise trap, A. van Harten & A. Sallam coll[lector]” (CNCI).. Paratypes: 1♂, al-Lahima, 1.i–9.iv.2001, MT, AvH; 1♀, 17.ix–14.xi.2001, MT, AvH.

Description: Holotype (Plate 25). Male. Body 4.34 mm. LFW 2.58 mm.



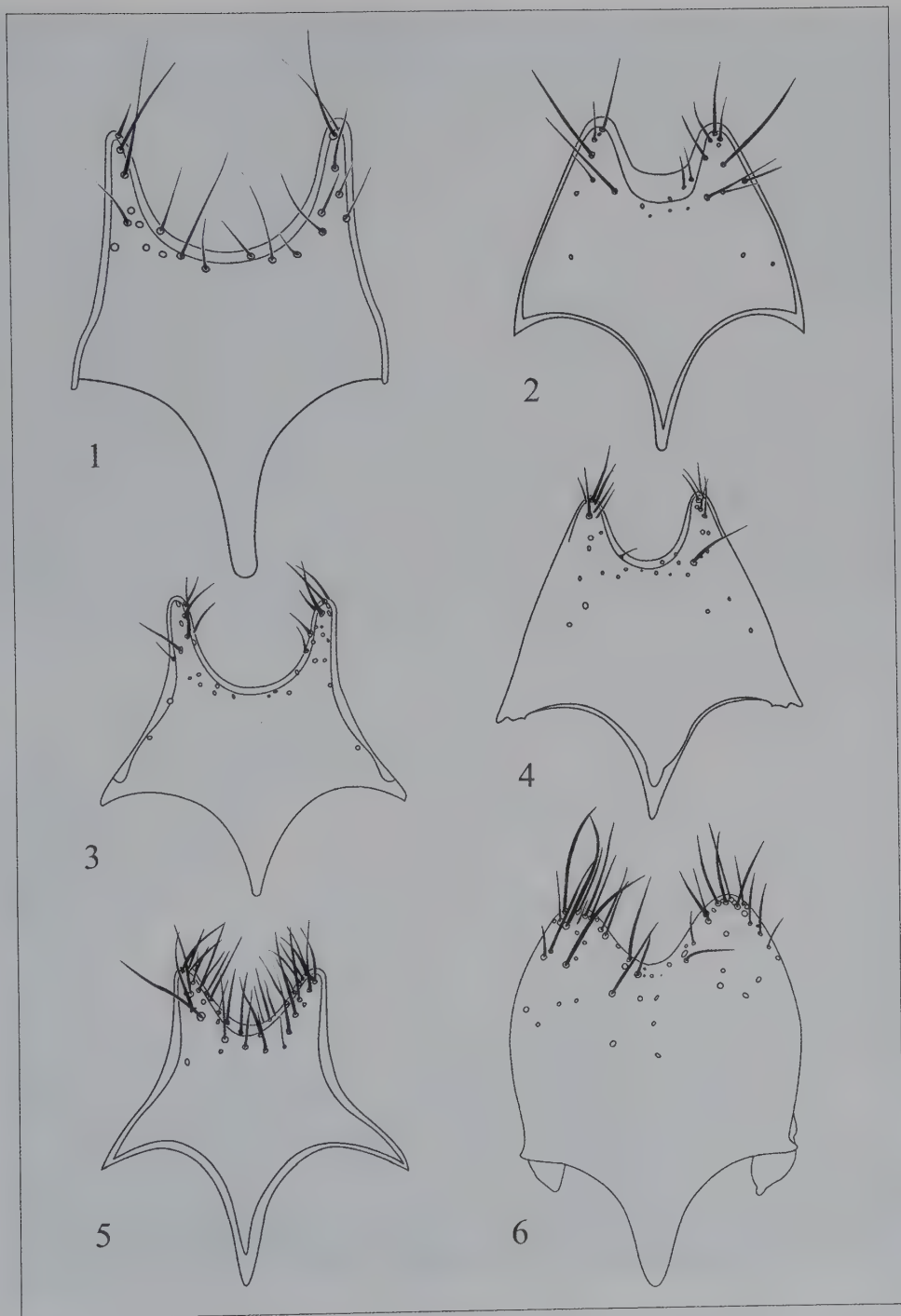
Plates 22–23. 22: *Metrionotus minutissimus* (Móczár), male, habitus; 23: *Metrionotus yarrowi* Móczár, female, habitus. Scale = 300µm.

Colouration. Head castaneous; scape castaneous; pedicel light castaneous; flagellum light castaneous; mandible castaneous; palpi dark castaneous; mesosoma castaneous, with propodeum dark castaneous nearly black; tegula castaneous; wings twice-banded; wing venation dark castaneous; fore coxa castaneous; mid coxa dark castaneous; hind coxa dark castaneous; trochanters castaneous; fore femur castaneous; mid femur dark castaneous; hind femur dark castaneous; fore tibia castaneous; mid tibia dark castaneous; hind tibia dark castaneous; tarsi castaneous; metasoma dark castaneous nearly black.

Head (Plate 27). Head as long as wide, narrow [in lateral view]. Malar space longer than VOL, convergent anteriorly. Mandible with three acute apical teeth, equally wide, lower margin curved, lower tooth longer than upper teeth, lower tooth wider than others. Palpi caliciform, flattened. Clypeus with median lobe delimited, rounded; lateral lobe present, shorter than median lobe; median clypeal carina arched, complete, straight shape [in dorsal view], below torulus. Intertorular distance more than torulus diameter. Antenna with conspicuous pubescence, erect, sparse and short; caliciform; scape curved, with same diameter across extension; pedicel longer than wide, caliciform; first flagellomere longer than pedicel, longer than others; flagellomeres long. Eye small, oval, glabrous, contour protuberant. Frons strongly foveolate. First five antennal segments in ratio of about 20:10:18:16:16. LH $1.0 \times$ WH. WF $1.61 \times$ HE. WF $0.63 \times$ WH. OOL $1.11 \times$ WOT. VOL $0.25 \times$ HE. Distance of posterior ocellus to vertex crest $2.83 \times$ DAO. Frontal angle of ocellar triangle acute; ocelli small; ocellar triangle compact, placed at posterior half of head; ocellar fovea present, wide. Temple profile divergent anterad. Vertex straight, its corner rounded. Hypostomal carina straight, forming acute angle medially. Dorsal half of occipital carina present, high, with side foveolate. Ventral half of occipital carina present, complete, high, with side foveolate.

Mesosoma (Plates 28, 29). Pronotal disc $0.6 \times$ as long as wide; anterior slope of pronotum inclined in profile; plate foveolate; plate groove present, foveolate, with anterior corner angled, trapezoidal, side straight, anterior margin convex, posterior margin concave; longitudinal pronotal furrow present, complete, deep. Propleuron with epicoxal sulcus, shallow, foveolate. Pleurosternum with epicoxal sulcus, foveolate. Mesoscutum coriaceous, long; longitudinal mesoscutal furrow incomplete; notaulus present, complete, convergent posteriorly, deep, wide, polished; parapsidal furrow present, incomplete, deep, parallel. Axila polished and shallow. Scutoscutellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, straight, dilated at ends. Scutellum short, coriaceous, not touching propodeal disc, with longitudinal median furrow. Metanotum overlapping lateral region of scutellum. Propodeal disc $0.55 \times$ as long as wide medially; short, with central fovea fused with propodeal triangle fovea, with three carinae; median carina complete; with longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina not fused anteriorly; inner discal carina complete; sublateral carina present; lateral carina present; followed by short striae; posterior carina complete; spiracle circular; posterior spines of propodeum present, short, thin, divergent. Declivity of propodeum areolate, with median carina, with lateral carina. Lateral surface of propodeum areolate, with upper carina, with posterior carina. Mesopleuron foveolate; with subtegular fovea continuous with episternal furrow; mesopleural sulcus present, foveolate, complete; episternal furrow with inner margin foveolate.

Wings. Tegula separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; basal vein angulate; transverse median vein biangulate; weakly developed, distal margin truncate; radial vein slightly curved



Figures 1–6. Male hypopygium. 1: *Anaylax simplicitus* nov. spec.; 2: *Clytrovorus exaggerates* nov. spec.; 3: *Metrionotus carbonarius*; 4: *Metrionotus indistinctus* nov. spec.; 5: *Metrionotus minutissimus*; 6: *Sulcomesitius vanharteni* nov. spec.



Plate 24. *Sulcomesitius richardsi* Móczár, female, habitus.

forward, originating from distal margin of stigma. Hind wing with costal vein short; with three distal hamuli, first hamulus widely separated from others.

Legs. Foretibia short [$1.5 \times$ first tarsomere length], with foretibial spur short [shorter than half length of first tarsomere]. Hind coxa with dorsal spine. Tarsi with tarsomeres I–IV progressively shorter distad, tarsomeres with short distal spines, conical; tarsal claw simple and arched with apex acute, base with only strong tooth, curved ventrad; arolium simple, apex angulate, large.

Metasoma. Metasoma $2.16 \times$ longer than wide; tergum I ventral region areolate, with lap of lateral margin, without lateral pilosity; dorsal region punctured, with lateral pilosity, ventral region punctured; dorsal region of terga III–VI polished; ventral region of terga III–VI polished, with posterior margin of tergites straight; with sparse setae at posterior margin of terga II–VI; hypopygium (Fig. 6) bilobate with median indentation, with lobate branch, longer than wide, posterior margin slightly concave, lateral margin convex, lateral margin straight, anterior corner angulate, with posterior margin unilobate, posterior lobes short.

Genitalia (Fig. 12). Genital ring protruding dorsally, with distal margin rounded and emarginated. Paramere fully divided into two arms; dorsal arm of paramere shorter than ventral arm, club-shaped, and with basal margin thin; ventral arm of paramere wide at apex; apex dense hairy; inner margin concave. Basivolsella fully outlined from basiparamere, with dense line of hairs. Cuspis biramous, with arms distinct; ventral arm not reaching dorsal arm apex, slender, and thick, apex with sickle process short and curved; dorsal arm slender, and with apex rounded. Aedeagus slender; with apex not reaching paramere apex, lobes touching each other; apical margin rounded with sickle process, apical sickle process long and curved; lateral margin of basal portion slightly convex. Apodeme parallel, base curved laterad.



Plates 25–26. 25: *Sulcomesitius vanharteni* nov. spec., male holotype, habitus; 26: *Sulcomesitius vanharteni* nov. spec., female paratype, habitus. Scale = 300 μ m.

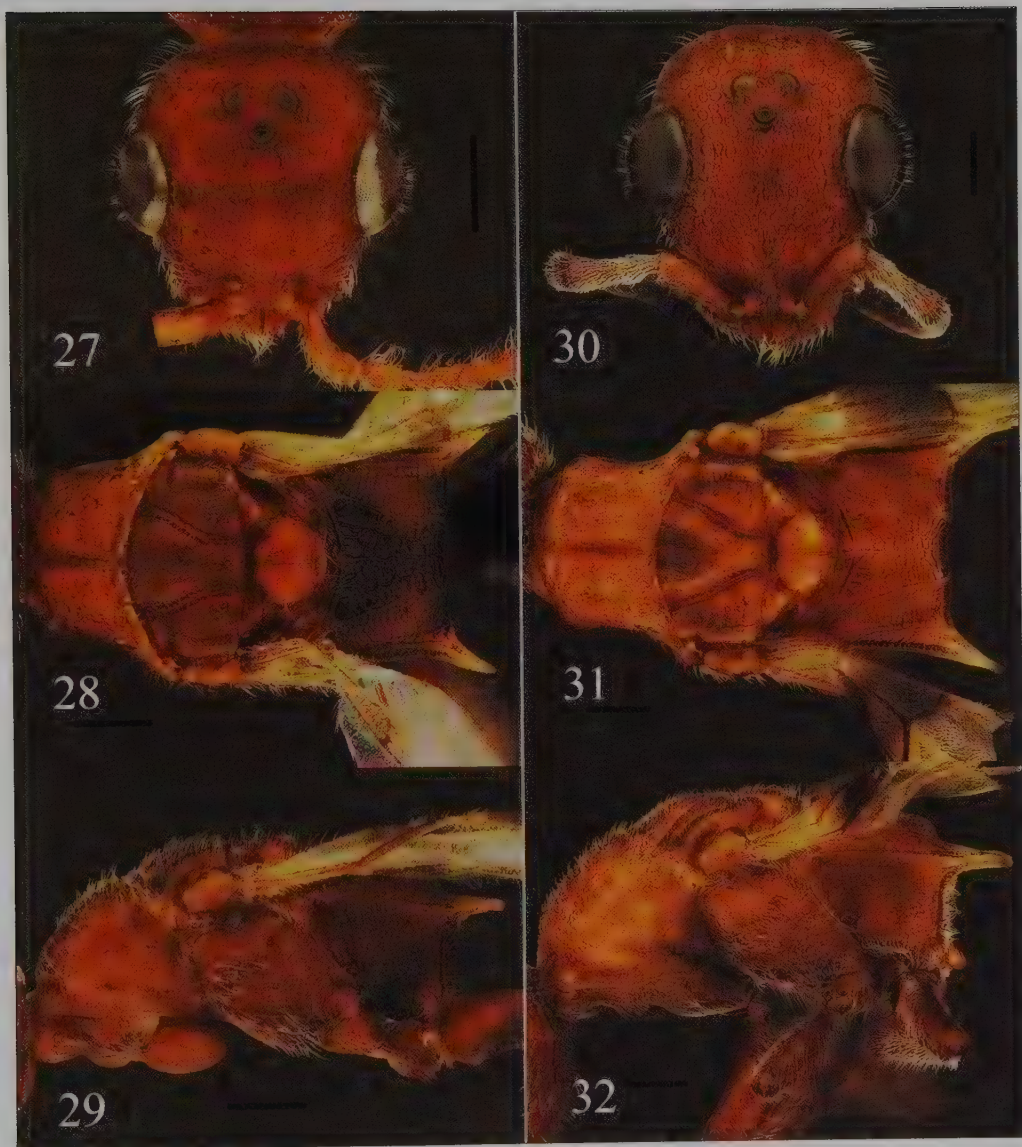
Description of female. Paratype (Plate 26). Body 8.21 mm. LFW 3.55 mm.

Colouration. Head castaneous; scape castaneous; pedicel castaneous; flagellum dark castaneous with first and second flagellomeres castaneous; mandible castaneous; palpi castaneous; mesosoma castaneous; tegula castaneous; wings twice-banded; wing venation dark castaneous; fore coxa castaneous; mid coxa castaneous; hind coxa castaneous; trochanters castaneous; fore femur castaneous; mid femur castaneous; hind femur castaneous; fore tibia castaneous; mid tibia castaneous; hind tibia castaneous; tarsi castaneous; metasoma dark castaneous nearly black.

Head (Plate 30). Head longer than wide, narrow [in lateral view]. Malar space longer than VOL, convergent anteriorly. Mandible with three acute apical teeth, equally wide, lower margin straight, lower tooth longer than upper teeth, lower tooth wider than others. Palpi caliciform, cylindrical. Clypeus with median lobe distinct, rounded; lateral lobe present, shorter than median lobe; median clypeal carina arched, complete, straight shape [in dorsal view], below torulus. Intertorular distance less than torulus diameter. Antenna cylindrical in shape with short semi-erect, dense pubescence; scape slightly curved, with same diameter across extension; pedicel longer than wide, caliciform; first flagellomere longer than pedicel, longer than others; flagellomeres short. First five antennal segments in ratio of about 37:13:19:11:11. LH $1.14 \times$ WH. WF $1.4 \times$ HE. WF $0.55 \times$ WH. OOL $1.0 \times$ WOT. VOL $0.16 \times$ HE. Eye small, oval, glabrous, contour protuberant. Frons strongly foveolate; with frontal carina. Distance of posterior ocellus to vertex crest $3.75 \times$ DAO. Frontal angle of ocellar triangle acute; ocelli small; ocellar triangle compact, placed at posterior half of head; ocellar fovea present, narrow. Temple profile parallel. Vertex straight, its corner rounded. Hypostomal carina forming obtuse angle. Dorsal half of occipital carina present, high, with side strigate. Ventral half of occipital carina present, complete, high, with side strigate.

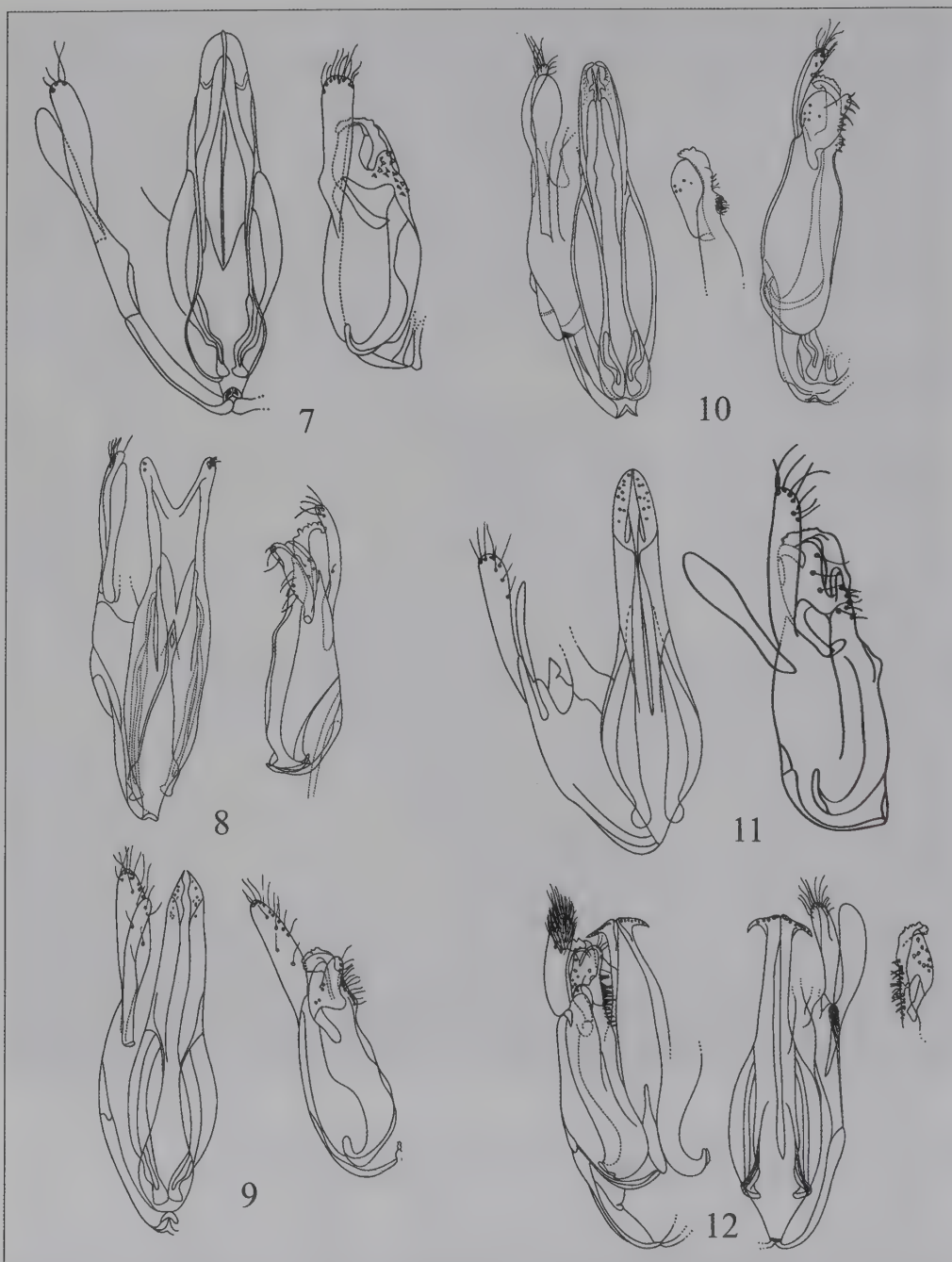
Mesosoma (Plates 31, 32). Pronotal disc $0.77 \times$ as long as wide; anterior slope of pronotum inclined in profile; plate not foveolate; plate groove absent, foveolate, with anterior corner angled, trapezoidal, side slightly concave, anterior margin convex, posterior margin concave; longitudinal pronotal furrow present, complete, deep. Propleuron with epicoxal sulcus shallow, foveolate. Pleurosternum with epicoxal sulcus polished. Mesoscutum coriaceous, long; longitudinal mesoscutal furrow incomplete; notaulus present, complete, convergent posteriorly, deep, wide, polished; parapsidal furrow present, incomplete, shallow, parallel. Axilla strigate and shallow. Scutoscuteellar sulcus present, inconspicuous. Scutellar groove narrow, fused with axila, arched, not dilated at ends. Scutellum short, coriaceous, not touching propodeal disc, with longitudinal median furrow. Metanotum overlapping lateral region of scutellum. Propodeal disc $0.54 \times$ as long as wide medially; long, with central fovea fused with propodeal triangle fovea, with three carinae; median carina complete; without longitudinal ridge between median and inner discal carinae; with sublateral and inner discal carina not fused anteriorly; inner discal carina complete; sublateral carina present; lateral carina present, followed by short striae; posterior carina absent medially; spiracle circular; posterior spines of propodeum present, long, thin, divergent. Declivity of propodeum areolate, with median carina, with lateral carina. Lateral surface of propodeum areolate, with upper carina, with posterior carina. Mesopleuron foveolate; mesopleural sulcus present, foveolate, complete; episternal furrow absent.

Wings. Tegula separated from mesoscutum; Forewing with costal cell very narrow and longitudinally folded; median cell as long as submedian cell; basal vein angulate; transverse median vein biangulate; weakly developed, distal margin truncate; radial vein slightly curved forward, originating from distal margin of stigma. Hind wing with costal vein short; with distal hamuli, with three hamuli, first hamulus widely separated from others.



Plates 27–32. *Sulcomesitius vanharteni* nov. spec. 27–29. Male holotype. 27: Head in dorsal view; 28: Mesosoma in dorsal view; 29: Mesosoma in lateral view; 30–32. Female paratype. 30: Head in dorsal view; 31: Mesosoma in dorsal view; 32: Mesosoma in lateral view. Scale = 300µm.

Legs. Foretibia short [$1.5 \times$ first tarsomere length], with foretibial spur short [shorter than half length of first tarsomere]. Hind coxa with dorsal spine. Tarsi with basal tarsomere longer than others, tarsomeres with short distal spines, cylindrical; tarsal claw bifid, curved mesad; arolium simple, apex straight, slender.



Figures 7–12. Male genitalia. 7: *Anylax simplicitus* nov. spec.; 8: *Clytrovorus exaggerates* nov. spec.; 9: *Metrionotus carbonarius*; 10: *Metrionotus indistinctus* nov. spec.; 11: *Metrionotus minutissimus*; 12: *Sulcomesitius vanharteni* nov. spec.

Metasoma. Metasoma $3.02 \times$ longer than wide; tergum I ventral region foveolate, with lap of lateral margin, with lateral pilosity; dorsal region polished, with lateral pilosity, ventral region punctured; dorsal region of terga III–VI polished; ventral region of terga III–VI polished; with posterior margin of tergites toothed; with sparse setae at posterior margin of terga II–VI. Remarks: This species is similar to *S. erdoesi* Móczár, 1970, by having the antenna with first flagellomere longer than others, the anterior margin of clypeus rounded, the pronotum with longitudinal furrow complete and deep, the mesonotum with longitudinal furrow distinct only on distal half and slightly interrupted, the lateral spines of propodeum acute, tergum II with very fine and scattered punctures. However, *S. vanharteni* nov. spec. has the scutellar groove not dilated at extremity, the scutellum with a longitudinal furrow and without a small pit basally in the middle, the posterior spines of propodeum less than length of propodeum, whereas *S. erdoesi* has the scutellar groove dilated at extremities, the scutellum without a longitudinal furrow and with a small pit basally in the middle, the posterior spines of propodeum as long as length of propodeum.

Distribution: Yemen.

Etymology: The specific epithet *vanharteni*, from Latin, is in honour of Antonius van Harten, Coordinator of the UAE Insect Project, who has been responsible for a great improvement of our comprehension of the insects from the Arabian Peninsula.

ACKNOWLEDGEMENTS

We are grateful to A. van Harten for the loan of the material studied and duplicates retained; to Daniele F. Mugrabi and Glenda Barbosa for the help with illustrations; to CNPq for the fellowships provided to both authors, grant #303216/2004-2 306231/2007-7 and #502656/2007-7.

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Authors' addresses:

D.N. Barbosa and C.O. Azevedo, Universidade Federal do Espírito Santo, Departamento de Biologia, Av. Marechal Campos 1468, Maruípe, 29040-090 Vitória, ES, Brazil; e-mail: diegoentomo@gmail.com and bethylidae@gmail.com

Order Hymenoptera, family Formicidae

**Cedric A. Collingwood, Donat Agosti,
Mostafa R. Sharaf & Antonius van Harten**

INTRODUCTION

All ants are social insects, the various species living in societies of a dozen to many thousands of worker ants, brood and one or more egg-laying queens. Ants play an important role in the ecosystem in many ways. Their dominance in semi-arid habitats has a regulatory effect on other insects. In addition, they are a source of food for lizards, small predatory mammals, insectivorous birds and arthropods including spiders, ant-lions and beetles.

So far 12629 species of ants have been described worldwide (Antbase, 2011). Most of them occur in the hotter climates. From the Arabian Peninsula and adjacent islands at least 300 species of ants have been recorded (Collingwood, 1985; Collingwood & Agosti, 1996; Collingwood, Tigar & Agosti, 1997; Collingwood & van Harten, 1994, 2001, 2005; Collingwood et al., 2004; Sharaf, 2009; Aldawood & Sharaf, 2009; Aldawood et al., 2010; Aldawood et al., 2011 (in press); Sharaf & Aldawood, 2011a (in press), 2011b (in press)).

Until now only 44 species have been reported from the UAE, which were listed by van Harten (2005).

MATERIALS AND METHODS

This paper deals with ant specimens collected by Barbara Tigar during 1993 and 1995, by the UAE Insect Project during 2004–2010, and by the senior author during two collecting trips to the UAE in 1995 and 2005.

The number of specimens in each sample was not noted and is not indicated in the text. The majority of specimens remains in alcohol, only a few specimens of each species were mounted. The alcohol material will all be deposited in the collection of the Liverpool Museum, Liverpool, UK, and the mounted specimens will be divided between the collection of the Liverpool Museum, the UAE Invertebrate Collection and the collection of D. Agosti. The holotype of *Leptothorax liviae* nov. spec. was deposited in the Naturhistorisches Museum Basel, Switzerland (NHMB), the holotype and some paratypes of *Cataglyphis laylae* nov. spec. in the Musée d'Histoire Naturelle in Geneva, Switzerland (MHNG), the holotype of *Lepisiota elegantissima* nov. spec. as well as some paratypes of *Cataglyphis laylae* nov. spec. in the Nationaal Natuurhistorisch Museum (Naturalis), Leiden, Netherlands (RMNH), and paratypes of *Lepisiota elegantissima* nov. spec. and *Cataglyphis laylae* nov. spec. in the Liverpool Museum, Liverpool, UK (NML).

The authors considered that the ants will constitute a very important group for the assessment of biodiversity richness of areas in the UAE to be protected in future. For that reason it was decided to include the maximum possible of illustrations of the species listed. As none of the authors has the facilities to make good photographs, we required the assistance of www.antweb.org, a website with a wealth of information about ants. AntWeb Project Leader, Dr. Brian L. Fisher, California Academy of Science, San Francisco, USA, gave us permission to use illustrations from that website. It is hoped that with this information local naturalists will be able to start working on this important insect group. For species that are not illustrated, images might be found at antweb.org.

Keys to the subfamilies and genera of UAE Formicidae are included, but as the knowledge about the ant fauna is clearly not yet complete, we refrained from including keys to the species, as this might lead to confusion. It is recommended that in the near future a complete key to subfamilies, genera and species of ants of the whole Arabian Peninsula (comprising Kuwait, Saudi Arabia, Bahrain, Qatar, United Arab Emirates, Oman and Yemen) to be elaborated, joining all known information about ants in those countries.

All publications on UAE ants are available in digital form at antbase.org.

Abbreviations used: AvH = leg. A. van Harten; CAC = leg. C.A. Collingwood; LT = light trap; MT = Malaise trap; WT = water traps.

BRIEF OUTLINE OF ANT MORPHOLOGY

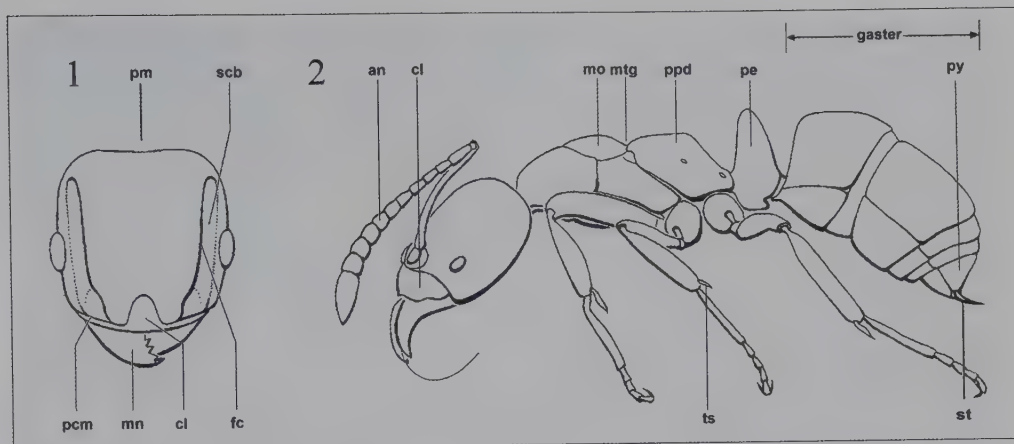
Figures 1 and 2 show the lateral and dorsal view of a worker of the subfamily Ponerinae, indicating the principal morphological features used in ant taxonomy. Ants are distinguished from other wasp-like Hymenoptera by the stalk-like constriction or peduncle between the mid-body and gaster, which may consist either of a single segment, the petiole, or of two segments, the second then called the postpetiole. The head varies enormously in shape. The antennae are composed of 4 to 13 segments and usually the male has one more than the female or worker. Winged female and worker ants have elbowed antennae. Compound eyes and three ocelli are well developed in the males, but in the females, and especially the workers, the eyes may be reduced or vestigial. A large and well developed sting is present in the females and workers of the subfamilies Ponerinae, Dorylinae, Pseudomyrmicinae and most Myrmicinae, but is vestigial or absent in the remainder.

Ants are highly polymorphic. The normal phases or castes are male, queen and worker. The male is the least variable of the three castes. The sense-organs, wings and genitalia are highly developed but the mandibles are often weak. The head is smaller and rounder than in the females and workers of the same species, and the antennae longer and more slender. Ocelli well developed. Gaster ending with distinct protruding genitalia.

The queen is the female characterized by her large stature and well developed reproductive organs. She is usually larger than the male and worker of the same species. The antennae and legs are often shorter and stouter than in the male, the mandibles are well developed and the gaster large. The worker is a female characterized by the absence of wings, the reduced thorax and small gaster. The eyes are small and the ocelli either absent or minute. Workers are usually variable in size and sometimes in colour or structure. When they are dimorphic without intermediance, the larger type with large head and mandible is termed a soldier (Imms, 1973). Workers of all ant species are always wingless (apterous); queens of most species have wings which are discarded after mating. The males in nearly all Arabian species are winged (alate).

BRIEF OUTLINE OF ANT BIOLOGY

The 'truly' social insects, or eusocial insects as they are sometimes called, like ants, can be distinguished by the following traits: a. individuals of the same species cooperate in caring for the young, b. there is a reproductive division of labour, with more or less sterile individuals working on behalf of fecund individuals, and c. there is an overlap of at least two generations in life stages capable of contributing to colony labour, so that offspring assist parents during some period of their life. The ants contain a greater number of known genera and species than all other eusocial groups (termites, bees and wasps) together. The diversity of their ecological and social adaptations is truly remarkable. Food specialization is extreme. The majority of ant



Figures 1–2. Morphological features of ant workers used in the keys (modified from Collingwood et al., 2004). Abbreviations: an = antenna; cl = clypeus; fc = frontal carina; mn = mandible; mo = mesonotum; mtg = metanotal groove; pcm = posterior clypeal margin; pe = petiole; pm = posterior margin of head; ppd = propodeum; py = pygidium; scb = antennal scrobe; st = sting; ts = tibial spur.

groups exhibits a highly variable degree in prey choice, while a few have come to subsist primarily on seeds. Still others rely entirely on the ‘honeydew’ secretions of homopterous insects reared in their nests or on special mutualistic fungi cultured on insect dung or vegetation. All members of the subfamily Cerapachyinae prey exclusively on other ants (Wilson, 1971).

The life cycle of an ant colony can be conveniently divided into three parts. The founding stage begins with the nuptial flight. The virgin queen departs from the nest in which she was reared. She meets one or more males and is inseminated. As soon as the queen is inseminated, she shed her membranous wings. The males die soon after, while the queen finds a suitable nest in the soil or plant material and constructs a first nest cell. Here she rears the first brood of workers, drawing on her own tissue reserves to produce eggs and feed the growing larvae. Soon after reaching the adult stage, the workers take over the task of foraging, nest enlargement, and brood care, so that the queen may confine herself to egg laying. After a period that ranges from a single season to several years, the colony begins to produce new queens and males (Hölldobler & Wilson, 1990).

SYSTEMATIC ACCOUNT

Key to the subfamilies of ants of the United Arab Emirates (workers)

- 1 Eyes absent (Plate 1, Fig. 3). Minute ants; length generally less than 2 mm and head width less than 0.25 mm in all castes **Leptanillinae**
- Eyes present (Plate 2, Fig. 5) 2
- 2 Peduncle with a single node or scale (Plate 3, Fig. 4) 4
- Peduncle with two distinct segments, the petiole and the postpetiole (Plate 4, Fig. 6) 3
- 3 Clypeus projects back between the frontal ridges (Plate 5, Fig. 7); tarsal claws simple. Ocelli absent in worker caste. In most species eyes small to medium sized ... **Myrmicinae**

- Clypeus does not project back between frontal ridges but bends vertically downwards in front of the head. Eyes large, at least one third head length (Plate 6, Fig. 8) **Pseudomyrmecinae**
- 4 Gaster with a projecting sting. First and second gaster tergites with a distinct constriction between them (Plate 7, Fig. 9) **5**
- Gaster without a projecting sting. First and second gaster tergites not separated by a distinct constriction (Plate 8, Fig. 10) **6**
- 5 Pygidium (last visible gaster tergite) rounded without short projecting teeth or spines. Antennal insertions concealed by frontal laminae in dorsal view (Plate 9, Fig. 11) **Ponerinae**
- Pygidium flattened, armed with very short spines or peg-like teeth. Antennal insertions exposed (Plate 10, Fig. 12) **Cerapachyinae**
- 6 Gaster with a fringe of hairs on the ultimate gastral segment (acidopore) (Plate 11) **Formicinae**
- Gaster without a fringe of hairs on the ultimate gastral segment **Dolichoderinae**

Subfamily **Ponerinae** Lepeletier, 1836

Key to the genera of Ponerinae occurring in the UAE (workers)

- 1 Basal portion of mandible with a distinct dorsolateral pit **Panchycondyla** F. Smith
- Basal portion of mandible without a dorsolateral pit **Hypoponera** Santschi

Hypoponera eduardi (Forel, 1894)

Plates 12–14

Specimens examined: Near al-Hayer, 30.i.2005, in leaf litter, AvH.

Distribution: Mediterranean species, also known from Saudi Arabia and Yemen. New to the UAE.

Hypoponera punctatissima (Roger, 1859)

Specimens examined: Sharjah Desert Park, 29.iii–6.iv.2005, LT, AvH.

Distribution: Cosmopolitan species. Recorded from Yemen and Oman. New to the UAE.

Hypoponera ragusai (Emery, 1894)

Specimens examined: Near al-Hayer, 14.ii.2005, in leaf litter, AvH.

Distribution: Mediterranean area, central Sahara, East Africa, Saudi Arabia. New to the UAE.

Pachycondyla sennaarensis (Mayr, 1862)

Plates 15–17, 35, 53

Specimens examined: Sharjah, 1.iii.2005, CAC. Sharjah Desert Park, 22.ii–16.iii.2005, LT, AvH.

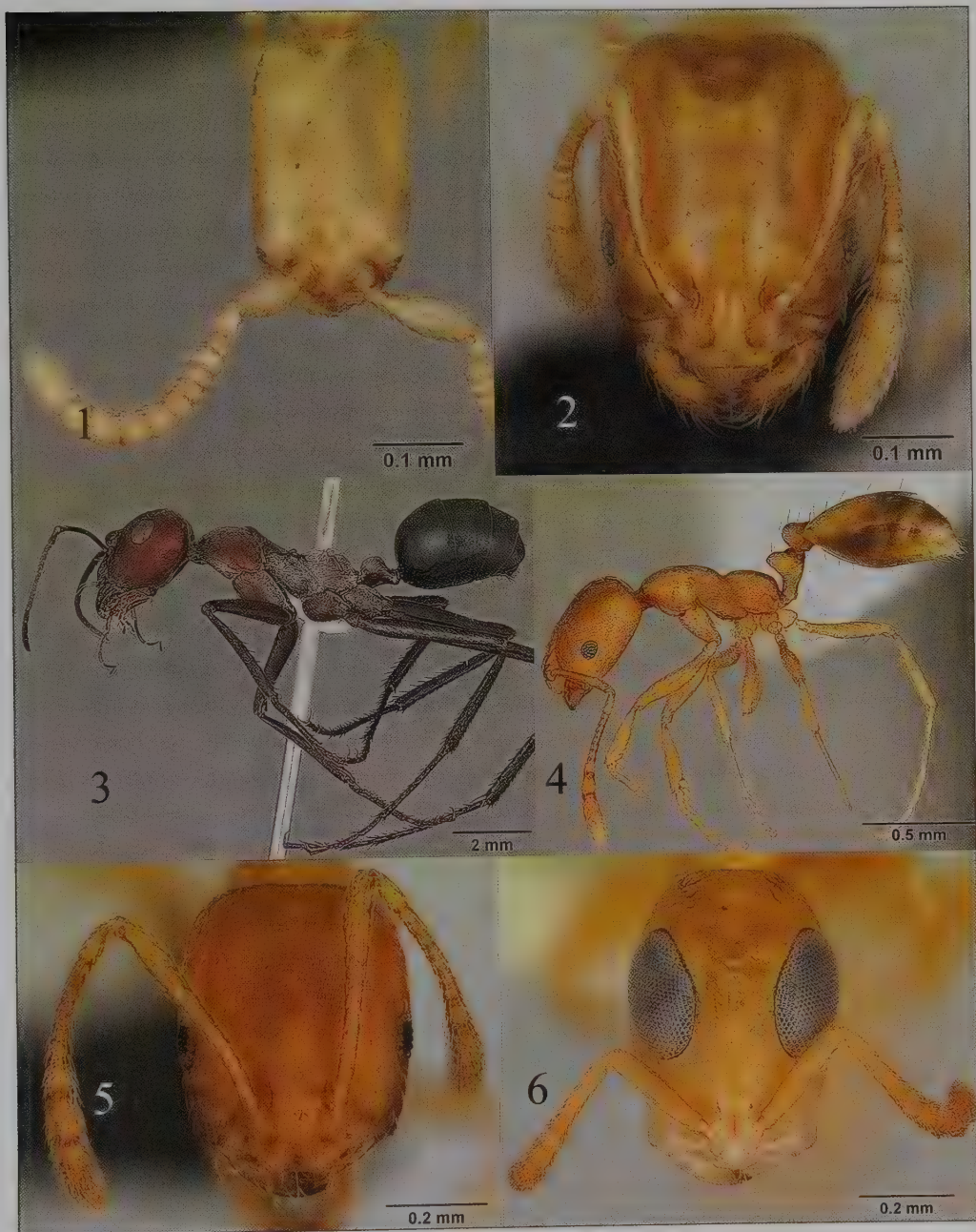
Remarks: In the UAE this species is known as the ‘Samsun ant’. Its painful sting is supposed in some cases to provoke allergic reactions that lead to the death of some persons (Dip, 1992; Dip et al., 1992; Rizk et al., 1998).

Distribution: Widely distributed throughout sub-Saharan Africa and the Arabian Peninsula.

Subfamily **Cerapachyinae** Forel, 1893

Cerapachys longitarsus (Mayr, 1879)

Specimens examined: Fujairah, males, 28.ii–1.iv.2006, LT, AvH.



Plates 1–6. 1: *Leptanilla* spec., head; 2: *Monomorium* spec., head; 3: *Cataglyphis* spec., habitus, in lateral view; 4: *Monomorium* spec., habitus in lateral view; 5: *Monomorium* spec., head; 6: *Tetraoponera* spec., head. (Photographs by A. Nobile, © www.antweb.org)

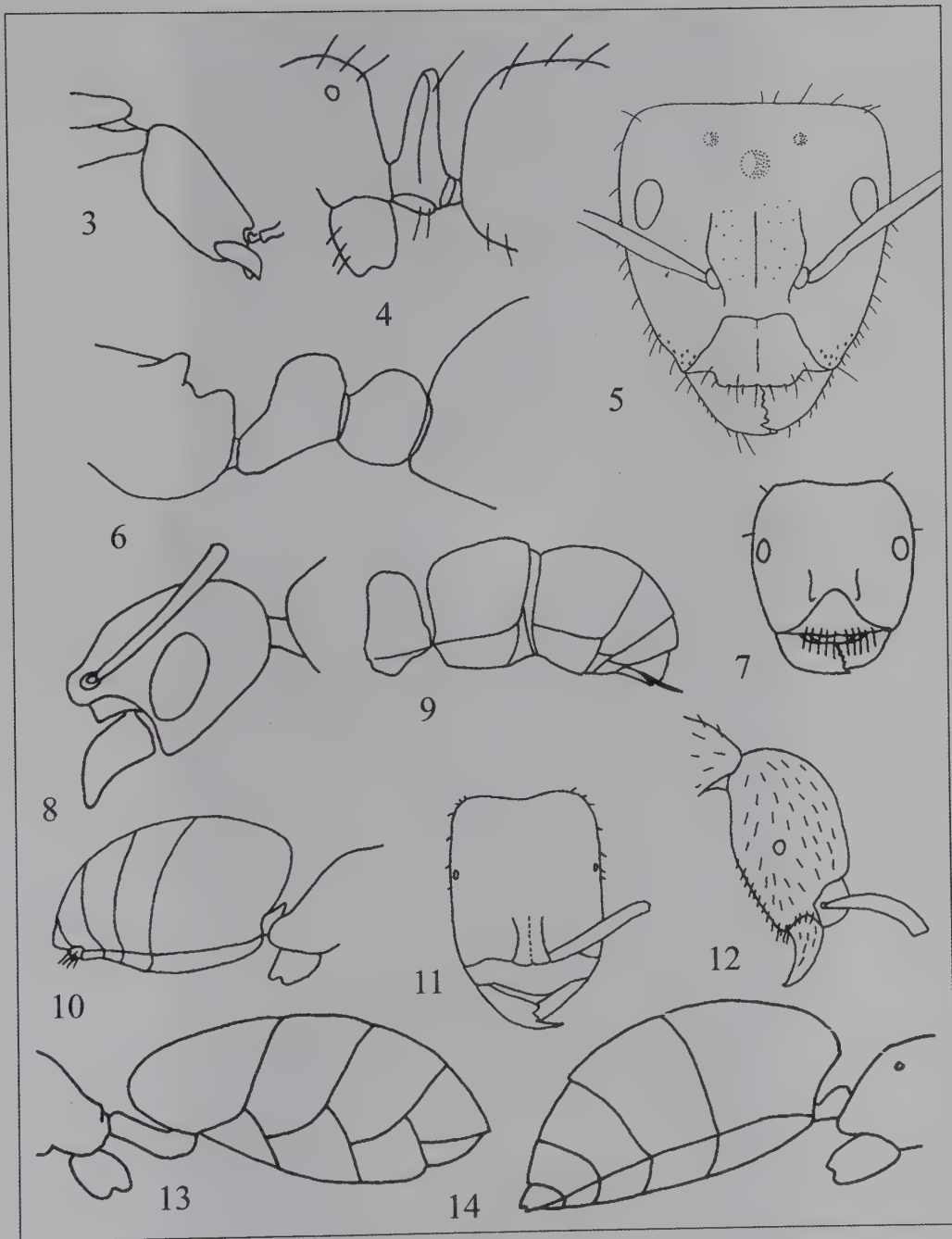


Plates 7–11. 7: *Cerapachys* spec, habitus in lateral view; 8: *Tapinoma* spec., habitus in lateral view; 9: Ponerinae, head; 10: *Cerapachys* spec., head; 11: *Cataglyphis* spec., habitus in lateral view; arrow showing acidopore. (Photographs 7–8, 10–11 by A. Nobile, 9 by M. Esposito, © www.antweb.org)

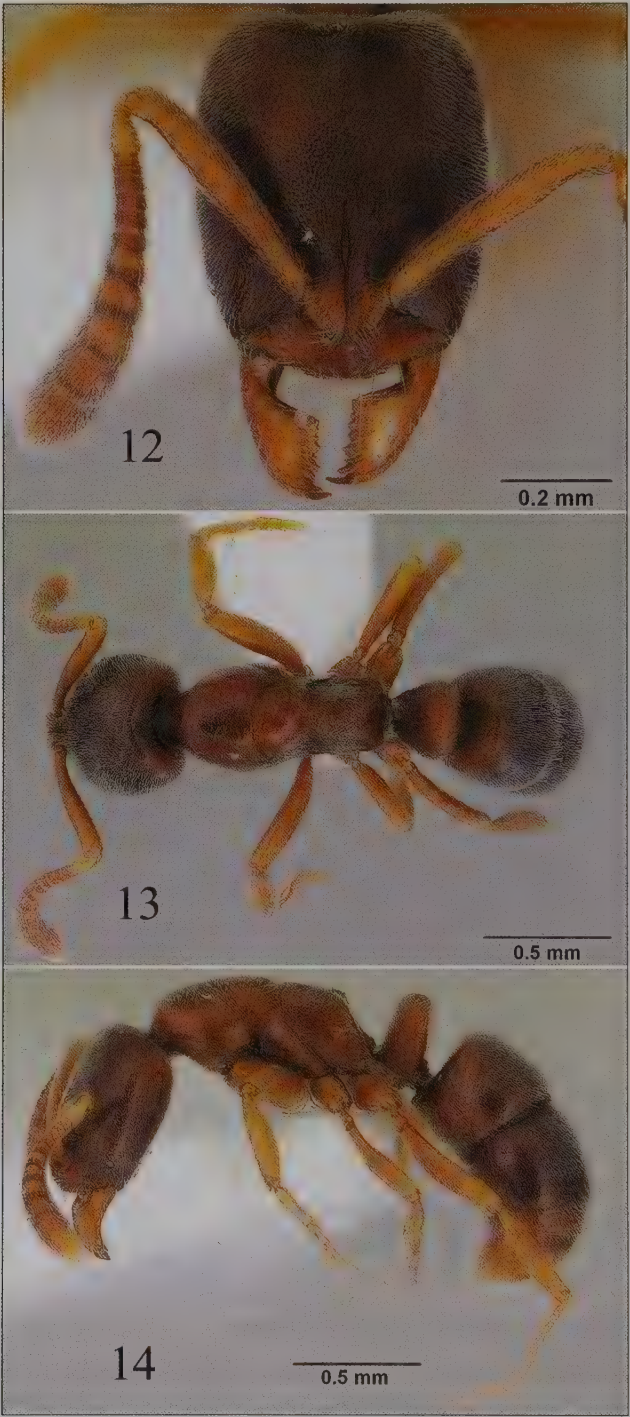
Distribution: Wide-ranging species recorded from North Australia, Philippines, India, North- and East Africa. In the Arabian Peninsula known from Saudi Arabia and Yemen. New to the UAE.

Cerapachys wroughtoni (Forel, 1910)
 Specimens examined: Near al-Hayer, 14.ii.2005, in leaf litter, AvH.

Plates 18–20



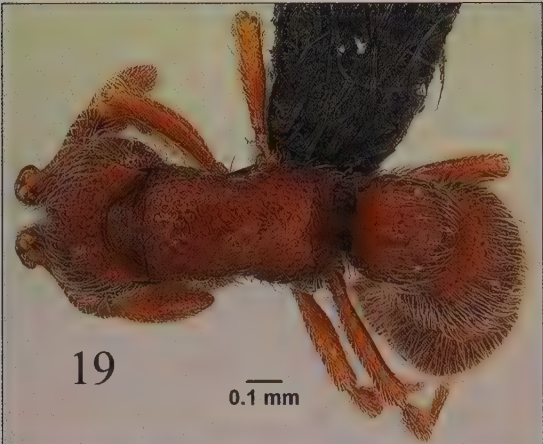
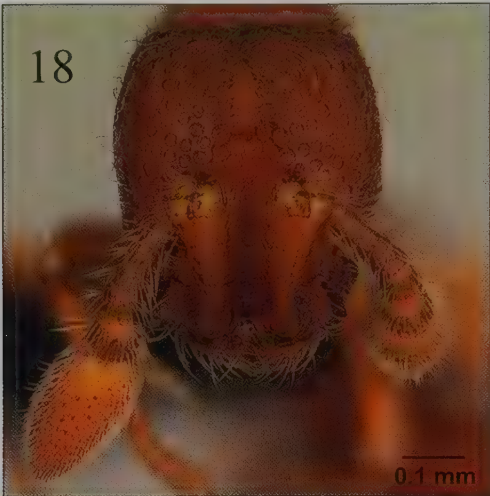
Figures 3–14. 3: *Leptanilla* spec., head; 4: *Pachycondyla* spec., peduncle; 5: *Camponotus* spec., head; 6: *Tetramorium* spec., peduncle; 7: *Messor* spec., head in dorsal view; 8: *Tetraponera* spec., head; 9: Ponerinae, peduncle and gaster; 10: *Plagiolepis* spec., peduncle and gaster; 11: Ponerinae, head in dorsal view; 12: *Cerapachys* spec., head; 13: *Tapinoma* spec., peduncle and gaster; 14: *Technomyrmex* spec., peduncle and gaster.



Plates 12–14. *Hypoponera eduardi* (Forel). (Photographs by A. Nobile, © www.antweb.org)



Plates 15–17. *Pachycondyla sennaarensis* (Mayr). (Photographs by M. Esposito, © www.antweb.org)



Plates 18–20. *Cerapachys wroughtoni* (Forel). (Photographs by E. Prado, © www.antweb.org)

Distribution: Known from southern Africa. New to the UAE.

***Cerapachys* spec.**

Specimens examined: Sharjah Desert Park, 29.iii–6.iv.2005, LT, AvH.

Subfamily **Leptanillinae** Emery, 1910

***Leptanilla islamica* Baroni Urbani, 1977**

Figure 15

Specimens examined: Fujairah, 16–24.ii.2005; 5.iii–6.iv.2005, LT, AvH. Sharjah Desert Park, 21–29.iii.2005, LT, AvH.

Distribution: Known only from Yemen. New to the UAE.

Subfamily **Dolichoderinae** Forel, 1878

Key to the genera of Dolichoderinae occurring in the UAE (workers)

- 1 Petiole without a scale and overhung by first gastral tergite 2
- Petiole with a scale, not completely overhung by the first gastral segment 3
- 2 In dorsal view four gastral segments visible (Fig. 13), anal orifices situated ventrally *Tapinoma* Foerster
- In dorsal view five gastral segments visible (Fig. 14), anal orifices situated apically *Technomyrmex* Mayr
- 3 Head about as broad as long, petiole sloped forward and partially overhung by first gastral segment (Fig. 16) *Bothriomyrmex* Forel
- Petiole an upright scale, not overhung by first gastral segment 4
- 4 Eyes set forward of middle line of head (Fig. 17) *Linepithema* Mayr
- Eyes set above middle line of head (Fig. 18) *Iridomyrmex* Mayr

***Bothriomyrmex* spec.**

Specimens examined: Sharjah Desert Park, 21–29.iii.2005, LT, AvH; 29.iii–6.iv.2005, LT, AvH.

Remarks: The second record of this genus from the Arabian Peninsula, after being found in Yemen (Collingwood & van Harten, 2005).

***Iridomyrmex anceps* (Roger, 1863)**

Plates 21–23

Specimens examined: Sharjah Desert Park, iii.2005, CAC. Fujairah, 5.iii–6.iv.2005, LT, AvH.

Distribution: Well-known species from the Indian subcontinent. In the Arabian Peninsula first recorded from the UAE (al-Ain) by Collingwood, Tigar & Agosti (1997); also known from Yemen.

***Linepithema humile* (Mayr, 1868)**

Plates 24–26

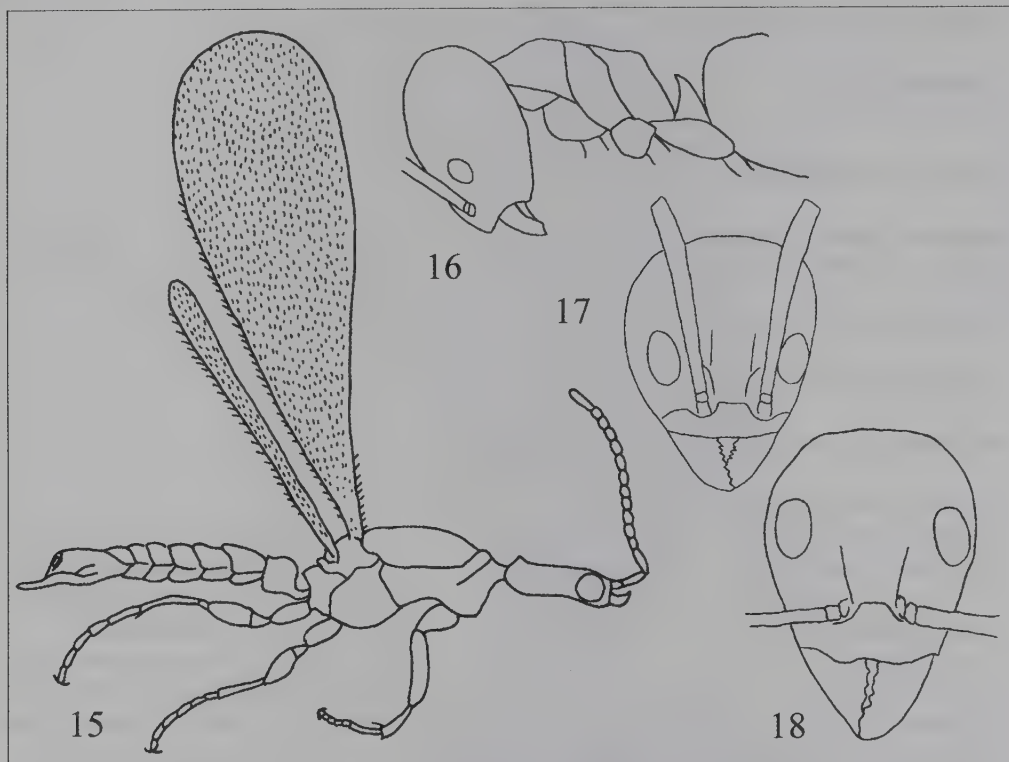
Specimens examined: Al-Ain, 13.iii.2005, CAC.

Distribution: The ‘Argentine ant’ came originally from Argentina, but this invasive species now has a global distribution, occurring especially in Mediterranean-type ecosystems. In the Arabian Peninsula first recorded from the UAE (al-Ain) by Collingwood, Tigar & Agosti (1997). Also reported from Yemen.

***Tapinoma melanocephalum* (Fabricius, 1793)**

Plates 27–29, 36, 54

Specimens examined: Al-Ain, 12.iii.2005, CAC. Al-Ajban, 9.xi–7.12.2005, LT & MT, AvH. Sharjah Desert Park, 5–6.x.2004, AvH.



Figures 15–18. 15: *Leptanilla islamica* Baroni Urbani, male; 16: *Bothriomyrmex* spec., head, mid-body and peduncle; 17: *Linepithema* spec., head in dorsal view; 18: *Iridomyrmex* spec., head in dorsal view.

Distribution: Another invasive species with a world-wide distribution (Wetterer, 2009a). This species feeds upon many household foods, it seems to show a preference for sweets, having been observed feeding on sugar, cakes, and syrups (Smith, 1965). Outdoors the workers are scavengers, consume dead insects and tend sap-sucking insects, collecting honeydew.

Recorded from the UAE (al-Ain) by Collingwood, Tigar & Agosti (1997). Also known from Yemen.

***Tapinoma simrothi* Krausse, 1911**

Plates 30–31

Specimens examined: Al-Ain, 13.iii.2005, CAC.

Distribution: Known from the Mediterranean area. Recorded from the UAE (al-Ain and Abu Dhabi) by Collingwood, Tigar & Agosti (1997). Also known from Saudi Arabia, Yemen, Oman and Kuwait. In Saudi Arabia, it is distinctly widely distributed in the central region (Riyadh and areas around).

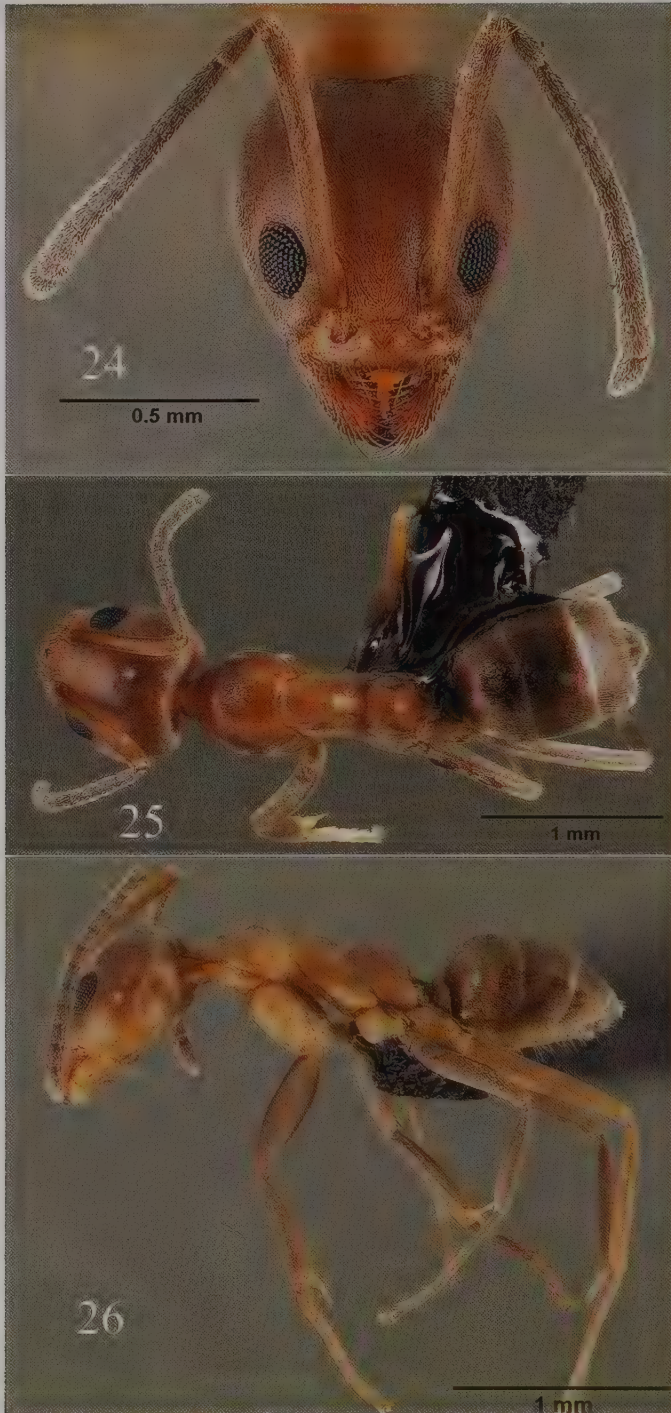
***Technomyrmex bruneipes* Forel, 1895**

Specimens examined: Al-Ajban, 9.xi–7.12.2005, LT & MT, AvH.

Remarks: Bolton (2007) considers *T. bruneipes* a synonym of *T. albipes* (F. Smith, 1861), a tramp species widespread in Asia and Africa.



Plates 21–23. *Iridomyrmex anceps* (Roger). (Photographs A. Nobile, © www.antweb.org)



Plates 24–26. *Linepithema humile* (Mayr). (Photographs by A. Nobile, © www.antweb.org)



Plates 27–29. *Tapinoma melanocephalum* (Fabricius). (Photographs by A. Nobile, © www.antweb.org)



Plate 30–31. *Tapinoma simrothi* Krausse, from Abu Dhabi. (Photographs by D. Agosti)

Distribution: Described from India. In the Arabian Peninsula known from Yemen. New to the UAE.

Subfamily **Pseudomyrmicinae** M.R. Smith, 1952***Tetraponera ambigua*** (Emery, 1895)*Tetraponera bifoventrata* (Mayr, 1895) (synonym, see: Ward, 2006).

Specimens examined: Sharjah Desert Park, 15.iii.2005, CAC.

Distribution: Widespread over the whole of Africa. In the Arabian Peninsula recorded as *T. bifoventrata* from Saudi Arabia and Yemen. New to the UAE.Subfamily **Myrmicinae** Lepeletier, 1835**Key to the genera of Myrmicinae occurring in the UAE (workers)**

- 1 Postpetiole attached mediodorsally to the first gaster tergite (Fig. 19); gaster heart-shaped from above (Fig. 20) ***Crematogaster*** Mayr
- Postpetiole attached medioventrally to the gaster (Fig. 22) which is pear-shaped in dorsal view (Fig. 21) 2
- 2 Antennae 10-segmented, the two apical segments forming a distinct club (Fig. 23) ***Solenopsis*** Westwood
- Antennae 11- or 12-segmented with a three segmented club (Fig. 24) or with a less well defined club of five thickened segment 3
- 3 Mandibles, in full-face view, broadly rounded or flat (Fig. 25). Workers polymorphic with head width increasing allometrically with increasing body size ***Messor*** Forel
- Mandibles, in full-face view, triangular (Fig. 26). Workers monomorphic or dimorphic . 4
- 4 Clypeus longitudinal bicarinate (Fig. 27). Propodeum without spines or teeth (Fig. 28) ***Monomorium*** Mayr
- Clypeus with median portion rounded or flat (Fig. 29). Propodeum bituberculate or with distinct spines or teeth (Fig. 30) 5
- 5 Clypeus raised into a ridge in front of antennal insertions (Fig. 32) ***Tetramorium*** Mayr
- Clypeus not raised into a ridge in front of antennal insertions 6
- 6 Dimorphic species; major workers have greatly enlarged incavate heads broad, three-toothed mandibles (Fig. 31). Minor workers have narrow heads with long multidentate mandibles (Fig. 33) ***Pheidole*** Westwood
- Monomorphic species; all workers in a colony of more or less even size and shape, having mandibles of five teeth. 7
- 7 Postpetiole enlarged, in most species wider than long in dorsal view and cordiform (Fig. 34). Mid body entirely without dorsal hairs ***Cardiocondyla*** Emery
- Postpetiole not conspicuously enlarged (Fig. 35). Body hairs present over whole dorsum . ***Leptothorax*** Mayr

Cardiocondyla bicoronata Seifert, 2003

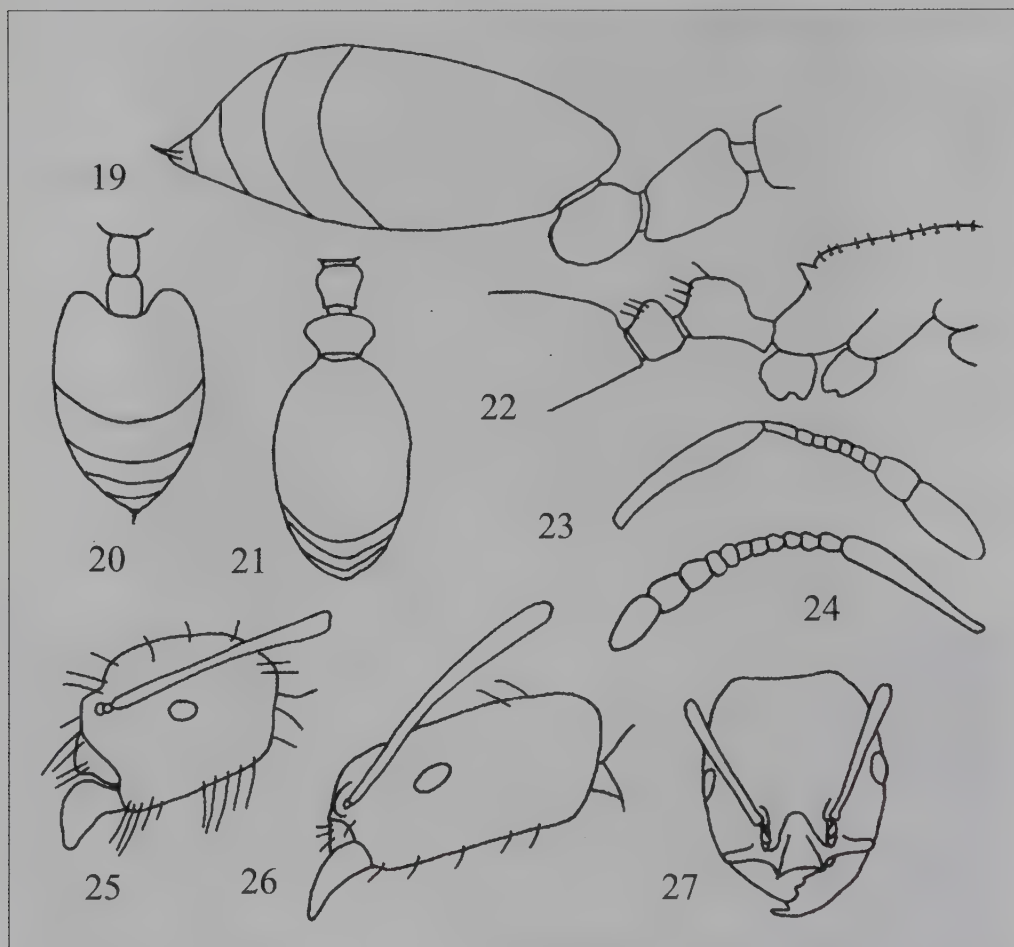
Remarks: Described by Seifert (2003) from Jordan, also recorded from Israel, Yemen and the UAE (Al-Ain zoo). No recent records.

Cardiocondyla emeryi Forel, 1881

Plates 32–34, 37, 55

Specimens examined: Al-Aslab, 19.ix.2005, at light, AvH. 7 km S of al-Jazirat al-Hamra, 16.xi.2004, AvH. Sharjah Desert Park, 6.x.2004, at light, AvH.

Distribution: Widely spread species, reported from southern Palaearctic, Ethiopian, Oriental, Nearctic and Neotropical regions. Recorded from the UAE (Ruweis) by Collingwood, Tigar & Agosti (1997). Also known from Yemen and Oman.



Figures 19–27. 19: *Crematogaster* spec., peduncle and gaster; 20: *Crematogaster* spec., gaster, dorsal view; 21: *Leptothorax* spec., gaster, dorsal view; 22: *Leptothorax* spec., peduncle and gaster; 23: *Solenopsis* spec., antenna; 24: *Tetramorium* spec., antenna; 25: *Messor* spec., head; 26: *Tetramorium* spec., head; 27: *Monomorium* spec., head, dorsal view.

***Cardiocondyla gallagheri* Collingwood & Agosti, 1996**

Specimens examined: Sharjah Desert Park, 10.xi.2004, AvH. Sweihan, iii.1995, CAC.

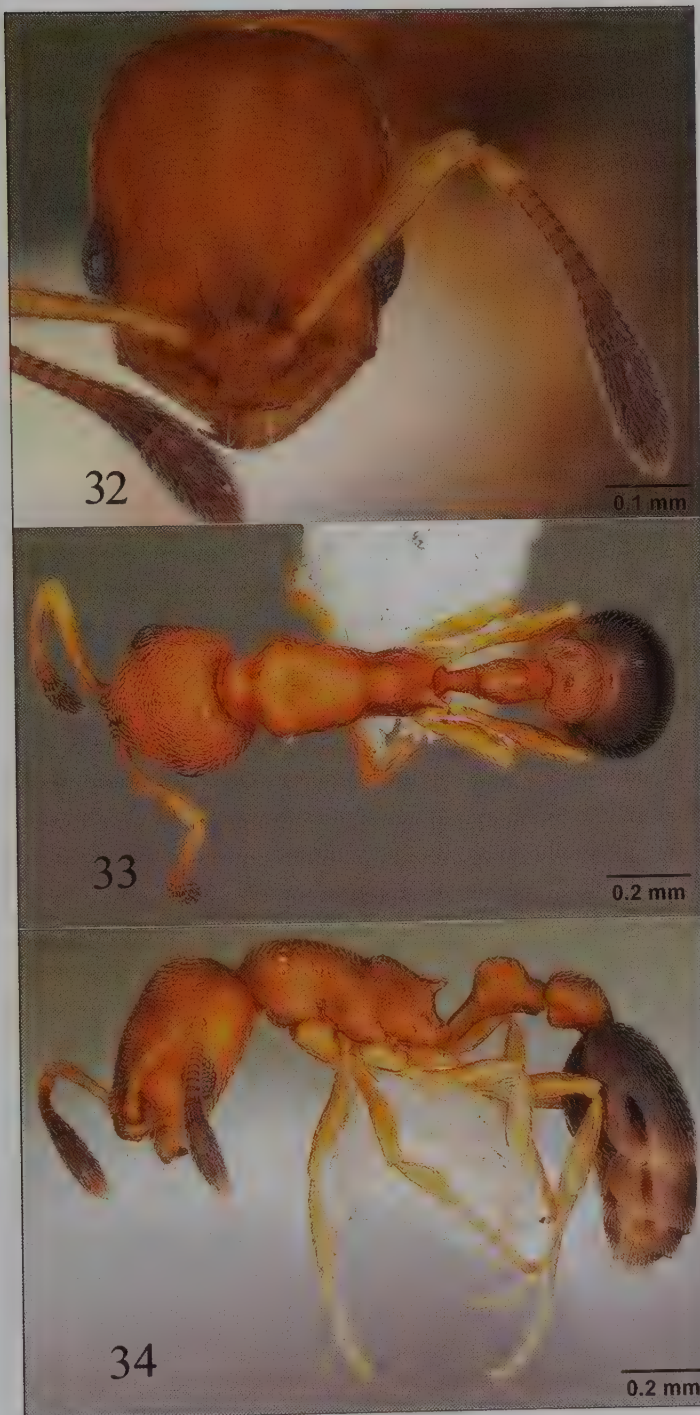
Distribution: Described from Oman. New to the UAE.

***Cardiocondyla mauritanica* Forel, 1890**

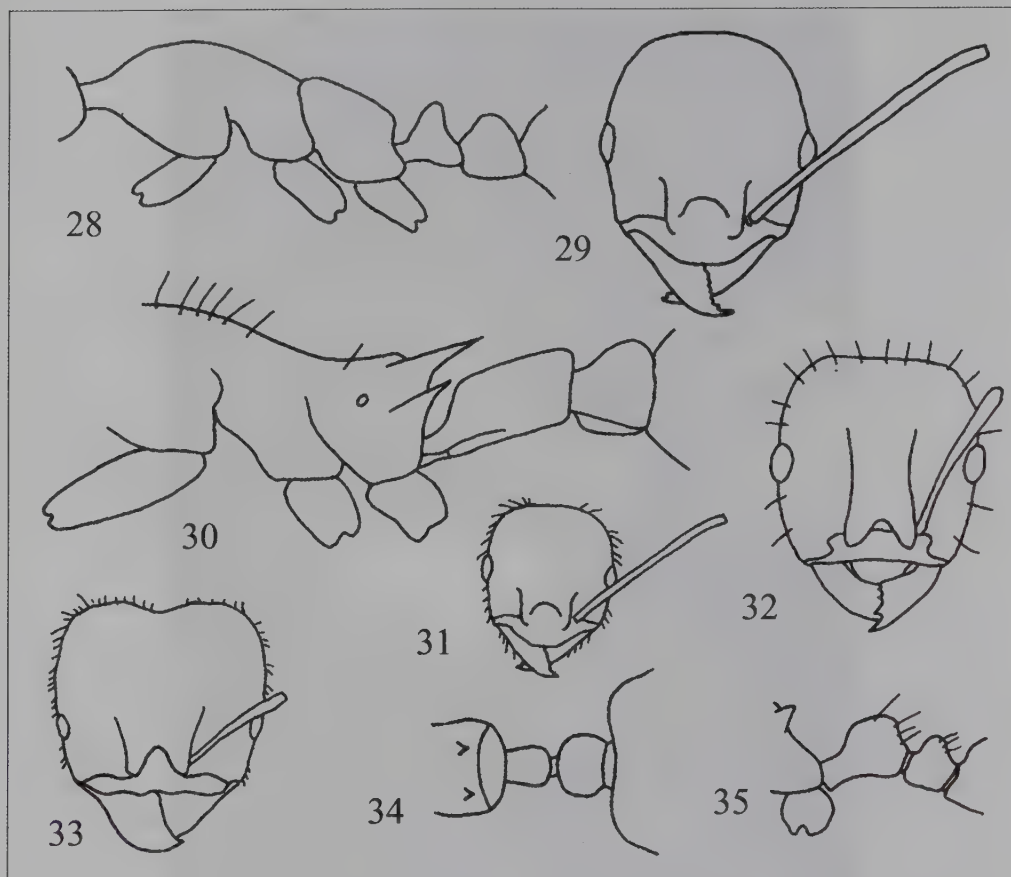
Cardiocondyla nuda mauritanica Forel, 1890

Specimens examined: Abu Dhabi, in park, iii.1995, CAC.

Distribution: Tramp species, known from Indonesia all the way westwards to Morocco. Introduced in the USA. Recorded from Yemen as *C. nuda* (Mayr, 1866). New to the UAE.



Plates 32–34. *Cardiocondyla emeryi* Forel. (Photographs by A. Nobile, © www.antweb.org)



Figures 28–35. 28: *Monomorium* spec., mid-body and peduncle; 29: *Pheidole* spec., head, dorsal view; 30: *Tetramorium* spec., mid-body and peduncle; 31: *Pheidole* spec., head, minor worker, dorsal view; 32: *Tetramorium* spec., head in dorsal view; 33: *Pheidole* spec., major worker, head in dorsal view; 34: *Cardiocondyla* spec., peduncle; 35: *Leptothorax* spec., peduncle.

***Cardiocondyla shuckardi* Forel, 1891**

Specimens examined: 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH. 15 km ESE of Sharjah, 2.xii.2004, AvH.

Distribution: Tropical and subtropical Africa. First collected in the Arabian Peninsula by W. Büttiker in 1983 (Collingwood, 1996). Known from Saudi Arabia, Yemen and Kuwait. New to the UAE.

***Crematogaster aegyptiacus* Mayr, 1862**

Specimens examined: Sweihan, iii.1995, CAC.

Distribution: Recorded from Egypt, Saudi Arabia, Yemen, Oman, Eritrea and Kenya. New to the UAE.



Plates 35–37: 35: *Pachycondyla sennaarensis* (Mayr); 36: *Tapinoma melanocephalum* (Fabricius); 37: *Cardiocondyla emeryi* Forel. (Photographs © Fauna of Arabia)

***Crematogaster antaris* Forel, 1894**

Specimens examined: Bunaynah, iii.1995, CAC. 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH.

Distribution: Described from Algeria. First reported from the UAE by Tigar & Collingwood (1993). Known in the Arabian Peninsula from Kuwait, UAE, Oman and Yemen.

***Crematogaster mosis* Forel, 1909**

Specimens examined: Ghalilah, 8.iii.2005, CAC.

Distribution: Described from Israel. First reported from the UAE (Baynunah) by Collingwood & Agosti (1996). Also known from Yemen.

***Crematogaster oasisium* Santschi, 1911**

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, CAC. Abu Dhabi, Camel race track, iii.2005, CAC.

Distribution: Described from Tunisia. Known from Saudi Arabia and Oman. New to the UAE.

***Crematogaster senegalensis* Roger, 1863**

Plates 38–39

Specimens examined: Dhadnah, 20 m, 25°29'N 56°22'E, 16.iii.1995, on rocks with shrubs, leg. D. Agosti. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Described from Senegal, widespread in Africa. Known in the Arabian Peninsula from Saudi Arabia, Oman and Yemen. New to the UAE.

***Messor ebeninus* Santschi, 1927**

Distribution: Middle East species, described from Lebanon. First recorded from the UAE (Ras Ghanada) by Tigar & Collingwood (1993). No new records. Known from Egypt and in the Arabian Peninsula from Kuwait, Saudi Arabia, UAE, Oman and Yemen.

***Messor foreli* Santschi, 1923**

Plates 40–41

Specimens examined: Near al-Hayer, 14.ii.2005, in leaf litter, AvH. NARC, near Sweihan, 14.iii.2005, CAC.

Distribution: Common in the northern Sahara. First recorded from the UAE (Ras Ghanada) by Collingwood & Agosti (1996). Also known from Saudi Arabia and Oman.

***Messor hismai* Collingwood & Agosti, 1996**

Plates 42–43

Specimens examined: Baynunah, iii.1995, CAC. Sweihan, iii.1995, CAC.

Distribution: Described from Saudi Arabia. New to the UAE.

***Messor medioruber* Santschi, 1910**

Specimens examined: Sweihan, iii.1995, CAC. NARC, near Sweihan, 14.iii.2005, CAC.

Distribution: Described from Tunisia, widespread in northern Africa. In the Arabian Peninsula known from Kuwait. New to the UAE.

***Messor meridionalis* (André, 1883)**

Specimens examined: Ras Ghanada, iii.1995, CAC.

Distribution: Recorded from the Middle East and Afghanistan. First recorded from the UAE (Abu Dhabi) by Tigar & Osborne (1999). In the Arabian Peninsula also known from Kuwait, Saudi Arabia and Oman.

***Messor rufotestaceus* (Foerster, 1850)**

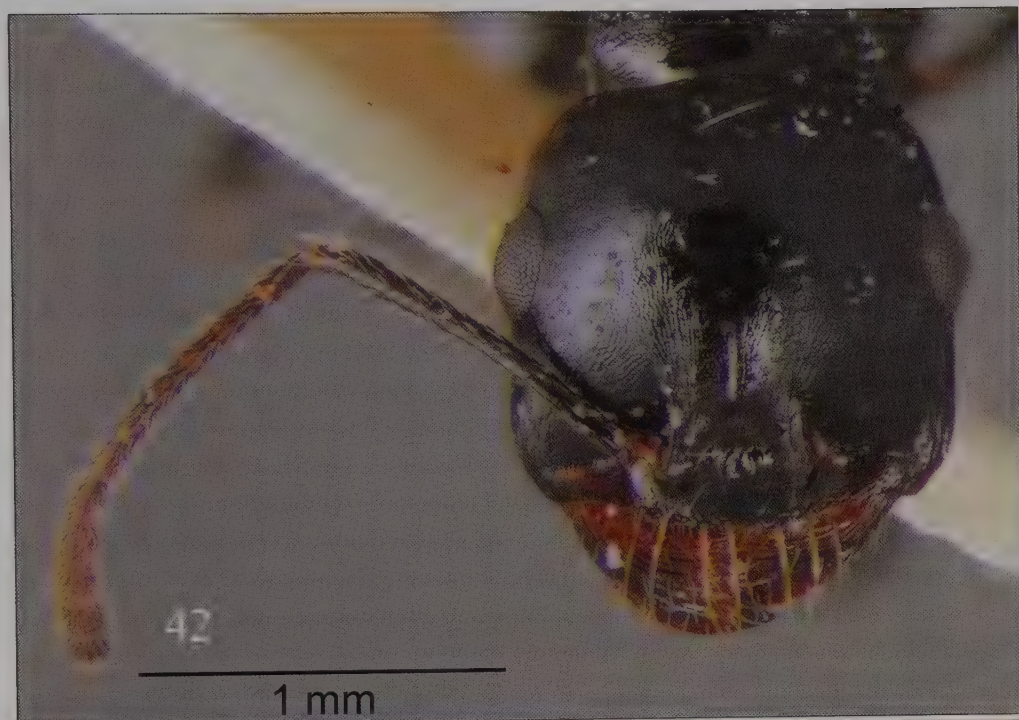
Specimens examined: Wadi Khatam, iii.1995, leg. B. Tigar.



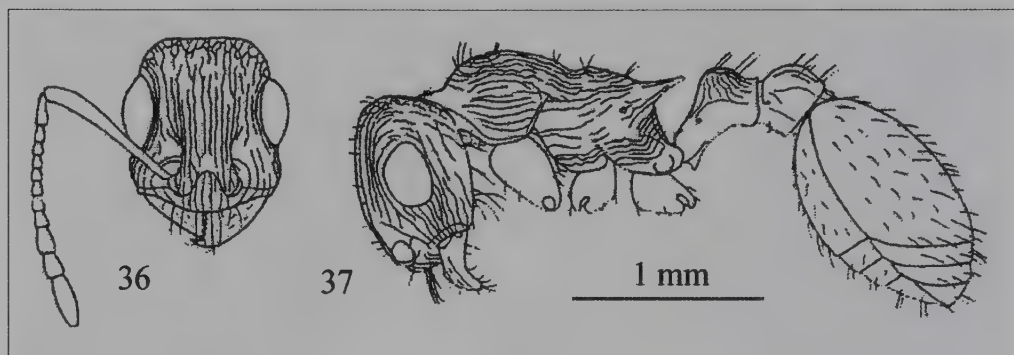
Plates 38–39. *Crematogaster senegalensis* Roger, from Dhadnah. (Photographs by D. Agosti)



Plates 40–41. *Messor foreli* Santschi. (Photographs by D. Agosti)



Plates 42–43. *Messor hismai* Collingwood & Agosti, from Hisma, Saudi Arabia. (Photographs by D. Agosti)



Figures 36–37. *Leptothorax liviae* Agosti & Collingwood nov. spec. 36: Head in dorsal view; 37: Body in lateral view.

Distribution: Recorded from the northern Sahara, Palestine and Syria. First recorded from the UAE by Tigar & Collingwood (1993). In the Arabian Peninsula also known from Saudi Arabia and Oman.

***Leptothorax liviae* Agosti & Collingwood nov. spec.**

Plates 44–46, Figures 36–37

Specimens examined: Holotype: ♀, United Arab Emirates, Baynunah sand desert [23°40'N 53°00'E], ii–iii.1995, in pitfall trap. leg. B. Tigar & C.A. Collingwood (NHMB). Paratypes: 1♀, same locality as holotype but 3.xii.1994, coll. B. Tigar. 1♀, Buraimi, 16.iii.1995, leg. B. Tigar & CAC. 1♀, al-Ain, 13.iii.2005, CAC. Not included in type series: ♀, same data as holotype.

Description: Holotype. Total length 4.2; head length 1.01; head width 0.87; scape length 0.91; cephalic index 86.1; scape index 104.6; eye length/head width 0.46. Mandibles weakly striate, head strongly striate, frontal triangle clear; alitrunk dorsum and petiole strongly striate, postpetiole striae restricted to dorsum; gaster shining. Frontal laminae prominent and expanded anterolaterally; eyes enormous, nearly half head length; scape relatively long, slightly over-reaching occipital border. Alitrunk dorsal outline with distinct metanotal furrow, but impression shallow. Propodeal spines long and pointed; petiole profile with rounded subangulate dorsum and blunt anterolateral tooth. Dorsal hairs rather short, ventral head hairs long and curved but not crowded. Gaster with short oblique hairs over whole surface. Colour evenly light brown with pale legs and antennae.

Remarks: The general appearance is somewhat like *Leptothorax cenatus* Bolton, 1982, but the species differs in the relatively larger eyes, longer coarser propodeal spines and the less angulate petiole. It is a larger species than the known North African or Iberian large-eyed desert species (*Leptothorax laurae* Emery, 1884 species group) and has a wider head, distinct longitudinal sculpture on the dorsum of the head, and fewer erect hairs on head and alitrunk than *Leptothorax arenarius* Santschi, 1908. The queen has features similar to the worker but the mesonotum is less coarsely sculptured. Worker specimens taken from under stones in the Buraimi area in the vicinity of trees are smaller than the holotype (TL 2.9–3.0) but have similar body structure and colour. *Leptothorax liviae* nov. spec. is the only *Leptothorax* taken so far from the UAE. Six species of *Leptothorax* were recorded from other countries of the Arabian Peninsula (Collingwood & Agosti, 1996), three of which had not been identified to the species level.

Etymology: This new species is dedicated to Livia Leu Agosti, wife of Donat Agosti.



Plates 44–45. *Leptothorax liviae* Agosti & Collingwood nov. spec., holotype from Baynunah sand desert [CASENT0102700]. 44: Habitus, dorsal view; 45: Habitus, lateral view. (Photographs by A. Nobile, © www.antweb.org)

Leptothorax megalops Hamann & Klemm, 1967

Specimens examined: Sharjah Desert Park, 29.iii–6.iv.2005, LT, AvH. Wadi Wurayah, 12–14.iv.2005, WT, leg. T. Pape.

Distribution: Described from Sudan. New to the UAE.



Plates 46. *Leptothorax liviae* Agosti & Collingwood nov. spec., holotype from Baynunah sand desert [CASENT0102700], head in dorsal view. (Photograph by A. Nobile, © www.antweb.org)

***Monomorium abeillei* André, 1881**

Specimens examined: Abu Dhabi, public hunting triangle, x.1995, PT, leg. B. Tigar. Al-Aslab, 19.ix.2005, at light, AvH.

Distribution: Wide-ranging Middle Eastern species. First recorded from the UAE (Ras Ghanada) by Tigar & Collingwood (1993). In the Arabian Peninsula also known from Kuwait, Saudi Arabia, Oman and Yemen.

***Monomorium abyssinicum* Forel, 1894.**

Specimens examined: Wadi Safad, 5.iii.2005, CAC.

Distribution: Type locality is Ethiopia. Recorded from West- and East Africa. New to the UAE.

***Monomorium acutinode* Collingwood & Agosti, 1996**

Specimens examined: Medinat Zayed, viii.1995, PT, leg. B. Tigar.

Distribution: Described from Oman. New to the UAE.

***Monomorium areniphilum* Santschi, 1911**

Specimens examined: Baynunah, iii.1995, CAC. 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH. Sharjah Desert Park, 5–6.x.2004, AvH. Al-Wathba Wetland Reserve, 23.viii.2004, AvH.

Distribution: Recorded from North Africa and the Middle East. In the Arabian Peninsula known from Saudi Arabia and Kuwait. New to the UAE.

***Monomorium barbatulum* Mayr, 1877**

Specimens examined: Abu Dhabi, public hunting triangle, iii.1995, CAC.

Distribution: Described from Kazakhstan. New to the UAE.

Monomorium baushare Collingwood & Agosti, 1996

Plates 56, 64

Specimens examined: Sharjah Desert Park, 6.x.2004, AvH; 6–28.xii.2006, PT, AvH. Wadi Safad, 20.xii.2005–2.i.2006, WT, AvH.

Distribution: Described from Oman. In the Arabian Peninsula also known from Yemen. New to the UAE.

Monomorium bicolor Emery, 1877

Specimens examined: Lahbab-al-Madam, 12.iii.2005, AvH.

Distribution: Widely distributed African species. Already recorded in the UAE from Um az-Zimul by Collingwood & Agosti (1996). In the Arabian Peninsula also known from Oman.

Monomorium buxtoni Crawley, 1920.

Specimens examined: Near Alhala, 10.iii.2005, CAC. Al-Wagan, iii.1995, CAC.

Distribution: Known from Iraq and Iran; in the Arabian Peninsula recorded from Kuwait. New to the UAE.

Monomorium carbo Forel, 1910

Specimens examined: Sharjah Desert Park, 9–21.iii.2005, LT, AvH..

Distribution: Described from Ethiopia. In the Arabian Peninsula also known from Oman. New to the UAE.

Monomorium chobauti Emery, 1896

Specimens examined: Baynunah, iii.1995, CAC. Medinat Zayed, iii.1995, CAC.

Distribution: Recorded from North Africa, Middle East and Turkey. First recorded in the UAE from Rhas Ganada by Collingwood & Agosti (1996). In the Arabian Peninsula also known from Saudi Arabia.

Monomorium clavicorne André, 1881

Specimens examined: Fujairah, 5.iii–6.04.2005, LT, AvH. Sharjah Desert Park, 3.iii.2005, CAC.

Distribution: Described from Israel. New to the UAE.

Monomorium destructor (Jerdon, 1851)

Plates 47–49, 57, 65

Specimens examined: Al-Ajban, 9.xi–7.12.2005, L & MT, AvH. Sharjah, 11–17.x.2004, at light, AvH. Sharjah Desert Park, 5–6.x.2004, AvH. Wadi Safad, 20.xii.2005–2.i.2006, WT, AvH. Al-Wathba Wetland Reserve, 23.viii.2004, AvH.

Distribution: Invasive ant species from the Old World tropics, nowadays spread worldwide (Wetterer, 2009b). Recorded from the UAE by Collingwood, Tigar & Agosti (1997). In the Arabian Peninsula also known from Saudi Arabia, Oman and Yemen.

Monomorium fayfaense Collingwood & Agosti, 1996.

Specimens examined: Wadi Wurayah, near waterfall, 24.ii.2005, AvH.

Distribution: Described from Saudi Arabia and Yemen. New to the UAE.

Monomorium fezzanense Collingwood & Agosti, 1996

Species described from Saudi Arabia and Oman; recorded from Abu Dhabi by Tigar & Osborne (1999). No recent specimens have been collected.

Monomorium hanaqe Collingwood & Agosti, 1996

Specimens examined: Al-Ain, 8.iv.2005, AvH. Jumeira, iii.1991, leg. C. Gross. Near Tayyibah, 10.iii.2005, AvH.



Plates 47–49. *Monomorium destructor* (Jerdon). (Photographs by A. Nobile, © www.antweb.org)

Distribution: Described from Saudi Arabia and Yemen. New to the UAE.

Monomorium hemame Collingwood & Agosti, 1996

Specimens examined: Jumeira, iii.1995, CAC.

Distribution: Described from Kuwait and Saudi Arabia. New to the UAE.

Monomorium indicum Forel, 1902

Plates 50–52

Specimens examined: Khor Kalba, lagoon, 12.iii.2005, AvH. Lahbab-al-Madam, 12.iii.2005, AvH.

Distribution: An Indian species, first recorded from the UAE by Collingwood, Tigar & Agosti (1997).

Monomorium lameerei Forel, 1902

Specimens examined: Dibba, iii.1995, CAC. Lahbab-al-Madam, 12.iii.2005, AvH. Sharjah, 11–17.x.2004, at light, AvH.

Distribution: Described from Algeria. New to the UAE.

Monomorium luteum Emery, 1881

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, C.A. Collingwood.

Distribution: Described from Yemen. New to the UAE.

Monomorium mintiribe Collingwood & Agosti, 1996

Specimens examined: Baynunah, iii.1995. Sharjah Desert Park, 3.iii.2005, CAC.

Distribution: Described from Oman and Saudi Arabia. New to the UAE.

Monomorium mayri Forel, 1902

Specimens examined: Al-Aslab, 19.ix.2005, at light, AvH. 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH. Ruwais, iii.1995, CAC.

Distribution: Described from India. In the Arabian Peninsula known from Saudi Arabia, UAE, Oman and Yemen. First recorded from the UAE by Tigar & Collingwood (1993).

Monomorium niloticum Emery, 1881

Specimens examined: Jebel Hafit, iii.1995, CAC; 13.iii.2005, CAC.

Distribution: Described from Egypt. In the Arabian Peninsula already known from Saudi Arabia, Oman and Yemen. New to the UAE.

Monomorium nitidiventre Emery, 1893

Specimens examined: 7 km S of al-Jazirat al-Hamra, 8.iii.2005, CAC. Wadi Wurayah, 12–14.iv.2005, T. Pape.

Distribution: In the Arabian Peninsula known from Saudi Arabia and Yemen. New to the UAE.

Monomorium perplexum Radchenko, 1996

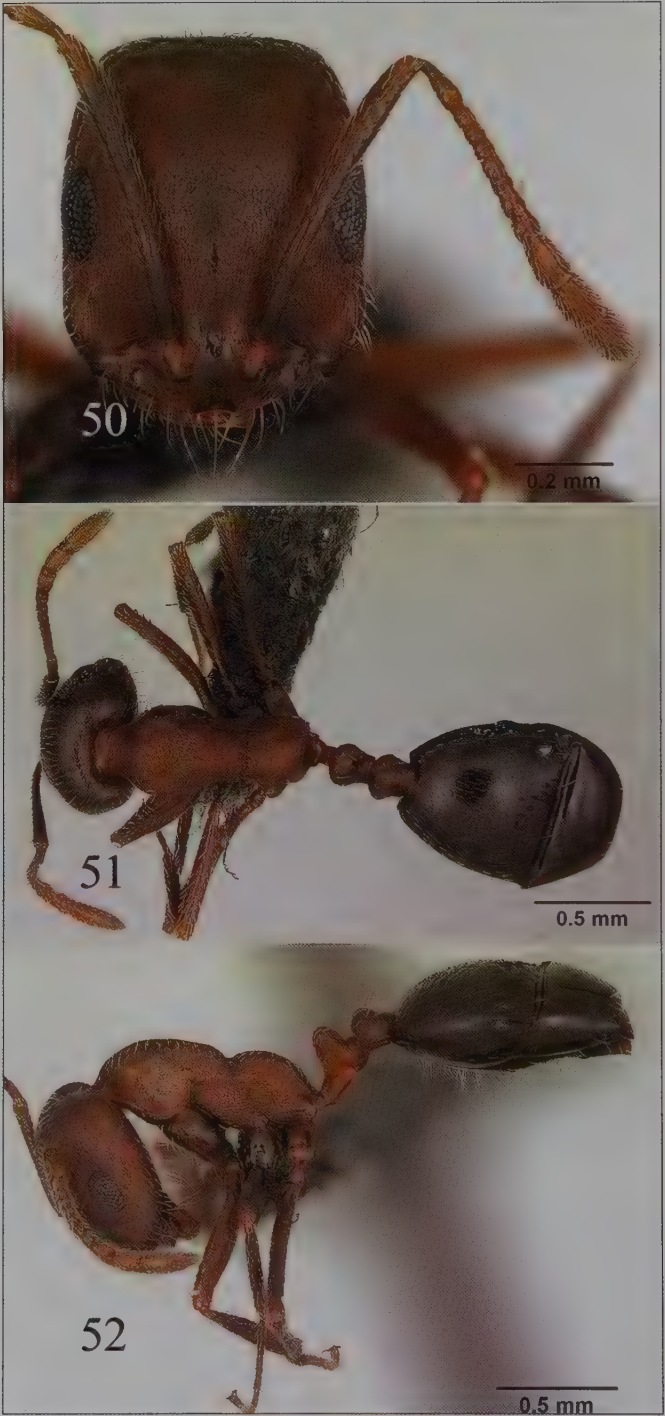
Specimens examined: Hatta-Khor Kalba, 12.iii.2005, CAC.

Distribution: Described from Armenia, Georgia, Turkey and Crete. New to the Arabian Peninsula and the UAE.

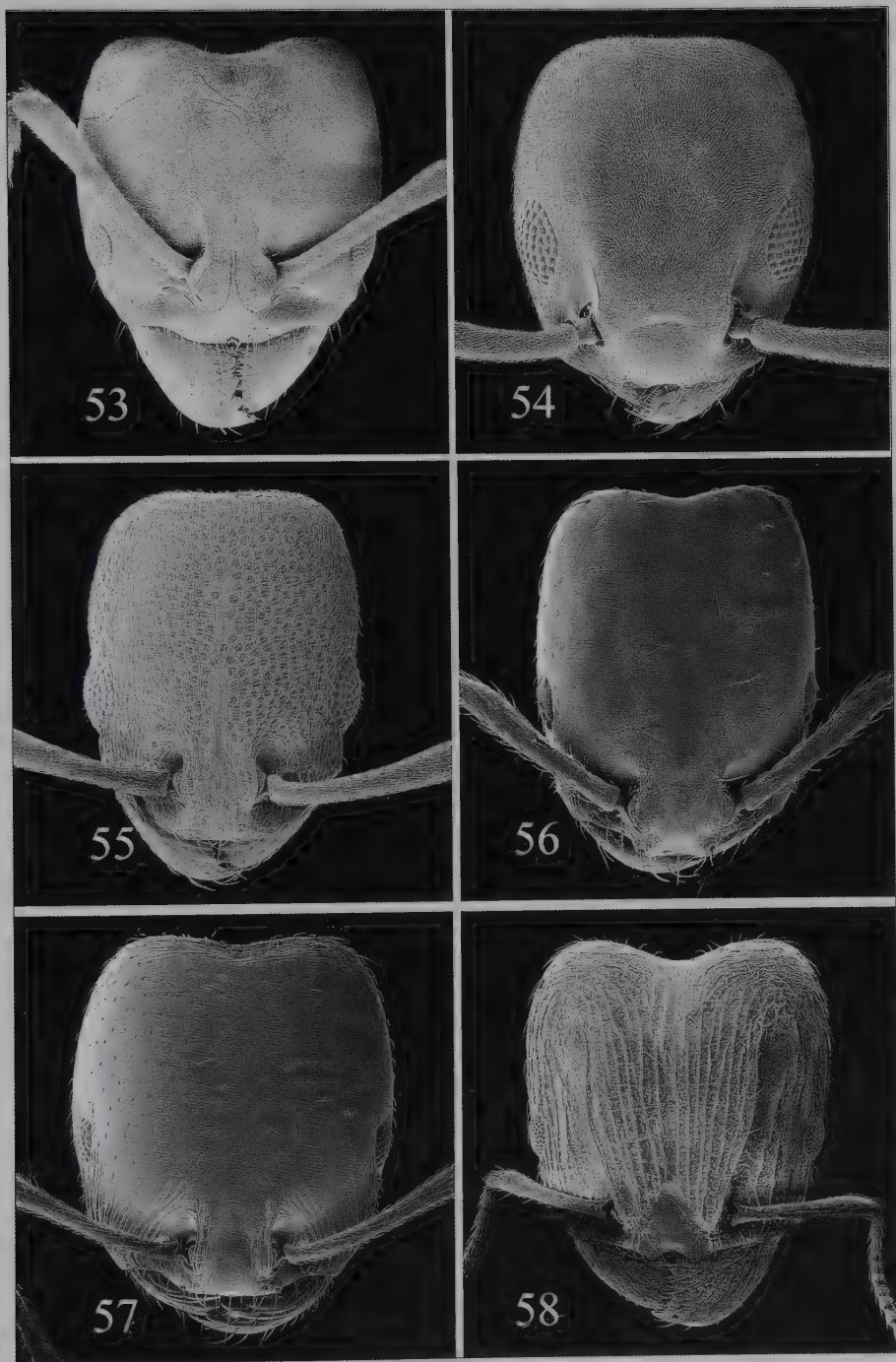
Monomorium phoenicium Santschi, 1927

Specimens examined: 15 km ESE of Sharjah, 2.xii.2004, AvH.

Distribution: Described from Lebanon, occurring in North Africa and the Middle East. In the Arabian Peninsula known from Saudi Arabia and Oman. New to the UAE.



Plates 50–52. *Monomorium indicum* Forel. (Photographs by A. Nobile, © www.antweb.org)



Plates 53–58. Heads in dorsal view. 53: *Pachycondyla sennaarensis* (Mayr); 54: *Tapinoma melanocephalum* (Fabricius); 55: *Cardiocondyla emeryi* Forel; 56: *Monomorium baushare* Collingwood & Agosti.; 57: *Monomorium destructor* (Jerdon); 58: *Pheidole teneriffana* Forel. (Photographs © Fauna of Arabia)

Monomorium qarahe Collingwood & Agosti, 1996

Specimens examined: Sharjah Desert Park, 14.x.2004, AvH; 3.iii.2005, CAC. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Described from the mountains of Saudi Arabia. New to the UAE.

Monomorium subopacum F. Smith, 1858

Plates 59–61

Specimens examined: Dubai, Mushrif Park, 6.iii.2005, CAC. Ruwais, iii.1995, CAC.

Distribution: Type locality: Portugal. Species widely spread around the Mediterranean and on the Atlantic islands. In the Arabian Peninsula known from Oman and Yemen. New to the UAE.

Monomorium tumaire Collingwood & Agosti, 1996

Distribution: The type locality of this species is Ras Ghanada, UAE. Also recorded from the UAE by Tigar & Collingwood (1993, as *Monomorium tumaire* MS), Tigar & Osborne (1999) and Gillett & Howarth (2004). No recent specimens have been collected.

Monomorium wahibiense Collingwood & Agosti, 1996

Distribution: Described from the Wahiba Sands in Oman. Also known from Jebel Hafit and Ras Ghanada (Collingwood & Agosti, 1996). No recent specimens have been collected.

Pheidole megacephala (Fabricius, 1793)

Specimens examined: Sharjah, 2.iii.2005, CAC. Sharjah Desert Park, 6–28.xii.2006, PT, AvH. Wadi Safad, 26.xii.2005–2.i.2006, WT, AvH.

Distribution: One of the world's most damaging invasive species, becoming a dominant species in many areas it has invaded (Dejean et al., 2007). In the Arabian Peninsula known from Saudi Arabia, Kuwait, Oman and Yemen. New to the UAE.

Pheidole sculpturata Mayr, 1866

Specimens examined: 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH.

Distribution: Widespread in Africa, from South Africa to Sudan. In the Arabian Peninsula known from Saudi Arabia, Oman and Yemen. New to the UAE.

Pheidole sinaitica Mayr, 1862

Plates 62–63

Specimens examined: 7 km S of al-Jazirat al-Hamra, 1.iii.2005, CAC. NARC, near Sweihan, 15–30.i.2005, LT, AvH. Wadi Safad, 26.xii.2005–2.i.2006, WT, AvH.

Distribution: Described from the Sinai Peninsula, recorded from North Africa and the Middle East. In the Arabian Peninsula known from Saudi Arabia and Oman. New to the UAE.

Pheidole teneriffana Forel, 1893

Plates 58, 66

Specimens examined: Al-Aslab, 19.ix.2005, at light, AvH.

Distribution: Described from the Canary Islands, recorded from the Mediterranean area and East Africa. Recorded from the UAE by Collingwood, Tigar & Agosti (1997). In the Arabian Peninsula also known from Saudi Arabia and Yemen.

Solenopsis geminata (Fabricius, 1804)

Plates 67–69

Specimens examined: Al-Aslab, 19.ix.2005, at light, AvH. Sharjah Desert Park, 5–6.x.2004, AvH.

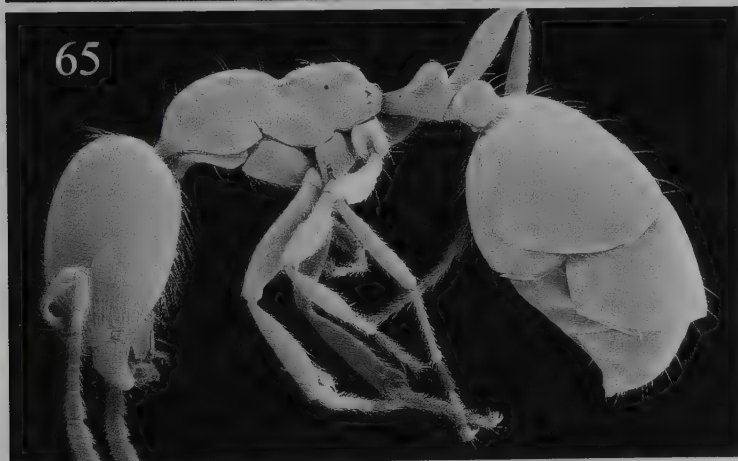
Distribution: Trager (1991) and Wetterer (2010) offer theories about how this species, notorious for its painful sting, spread around the tropics of the whole world. Recorded from the UAE by Collingwood, Tigar & Agosti (1997).



Plates 59–61. *Monomorium subopacum* F. Smith. (Photographs by A. Nobile, © www.antweb.org)



Plates 62–63. *Pheidole sinaitica* Mayr. (Photographs by D. Agosti)



Plates 64–66. 64: *Monomorium baushare* Collingwood & Agosti.; 65: *Monomorium destructor* (Jerdon); 66: *Pheidole teneriffana* Forel. (Photographs © Fauna of Arabia)



Plates 67–69. *Solenopsis geminata* (Fabricius). (Photographs by A. Nobile, © www.antweb.org)

Solenopsis omana Collingwood & Agosti, 1996

Specimens examined: Ruwais, iii.1995, CAC.

Distribution: Described from Oman and the UAE ('Suneira' – according to the coordinates on the outskirts of Dubai, near al-Awir).

Tetramorium bicarinatum (Nylander, 1846)

Plates 70–72

Specimens examined: Fujairah, iii.1995, CAC. Wadi Madaq, 21–22.i.2005, AvH.

Distribution: Cosmopolitan tramp species. First recorded from the UAE (Fujairah) by Collingwood, Tigar & Agosti (1997). Recently recorded from Saudi Arabia (Sharaf et al., 2011b).

Tetramorium calidum Forel, 1907

Specimens examined: Al-Ain, 13.iii.2005, CAC. Dubai, Mushrif Park, 6.iii.2005, CAC.

Distribution: Described from 'Arabia', recorded from Yemen and Oman. New to the UAE.

Tetramorium doriae Emery, 1881

Specimens examined: Abu Dhabi, Camel Race Track, 14.iii.2005, CAC.

Distribution: Described from 'Arabia', recorded from Saudi Arabia and Yemen. New to the UAE.

Tetramorium juba Collingwood, 1985

Specimens examined: Al-Ain, iii.1995, CAC. Sweihan, iii.1995, CAC.

Distribution: Described from Saudi Arabia, also known from Kuwait. New to the UAE.

Tetramorium latinode Collingwood & Agosti, 1996

Plates 73–76

Specimens examined: Sharjah Desert Park, 6.x.2004, AvH.

Distribution: Described from Yemen, recently recorded from Saudi Arabia by Sharaf & Aldawood, (2011b, in press). New to the UAE.

Tetramorium sericeiventre Emery, 1877

Plates 77–79

Specimens examined: Sharjah Desert Park, 29.iii–6.iv.2005, LT, AvH; 6–28.xii.2006, PT, AvH.

Distribution: Widespread in Africa. In the Arabian Peninsula known from Saudi Arabia, where it is very common, Yemen and Oman. New to the UAE.

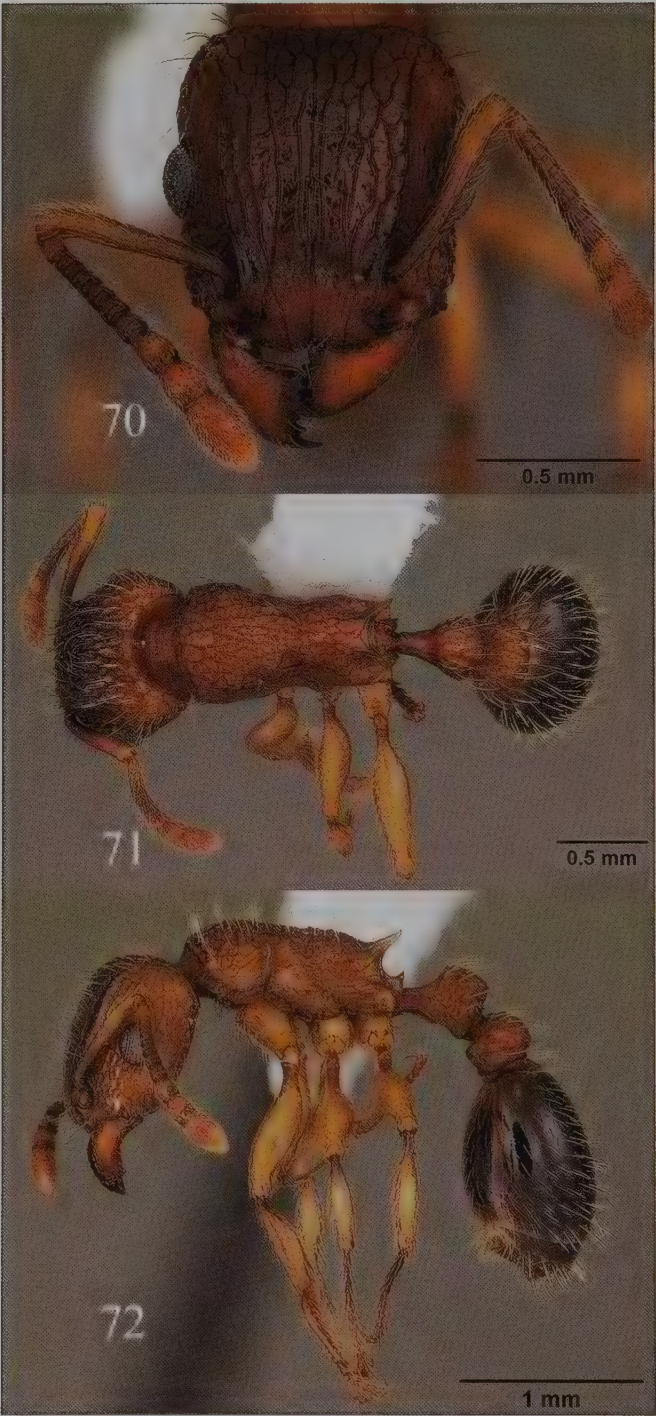
Tetramorium yemene Collingwood & Agosti, 1996

Specimens examined: Lahbab-al-Madam, 12.iii.2005, AvH.

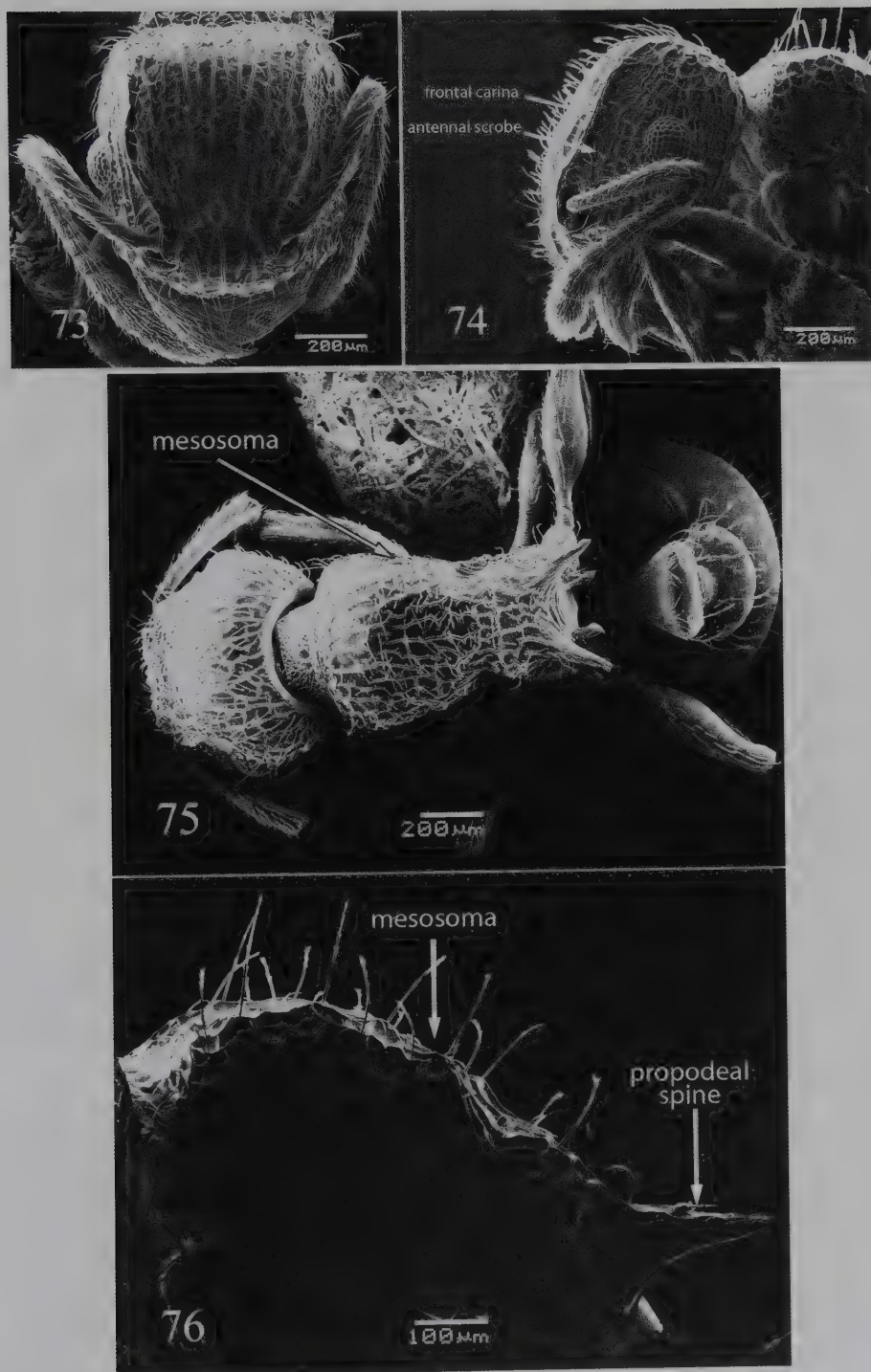
Distribution: Described from Yemen. New to the UAE.

Subfamily **Formicinae** Latreille, 1836**Key to the genera of Formicinae occurring in the UAE (workers)**

- | | | |
|---|---|-----------------------------|
| 1 | Antennae 12 segmented | 2 |
| – | Antennae 11 segmented. | 5 |
| 2 | Antennal insertions clearly distant from posterior clypeal margin (Figs 5 & 39) | 3 |
| – | Antennal insertions close to or contiguous with clypeal margin (Figs 40 & 41)..... | 4 |
| 3 | Petiole with spines or teeth | <i>Polyrhachis</i> Smith |
| – | Petiole entire or emarginated, never dentate | <i>Camponotus</i> Mayr |
| 4 | Ocelli present and distinct (Fig. 40). Head underneath with long curved hairs anteriorly. | |
| | Body with normal hairs (fine, not stout) | <i>Cataglyphis</i> Foerster |



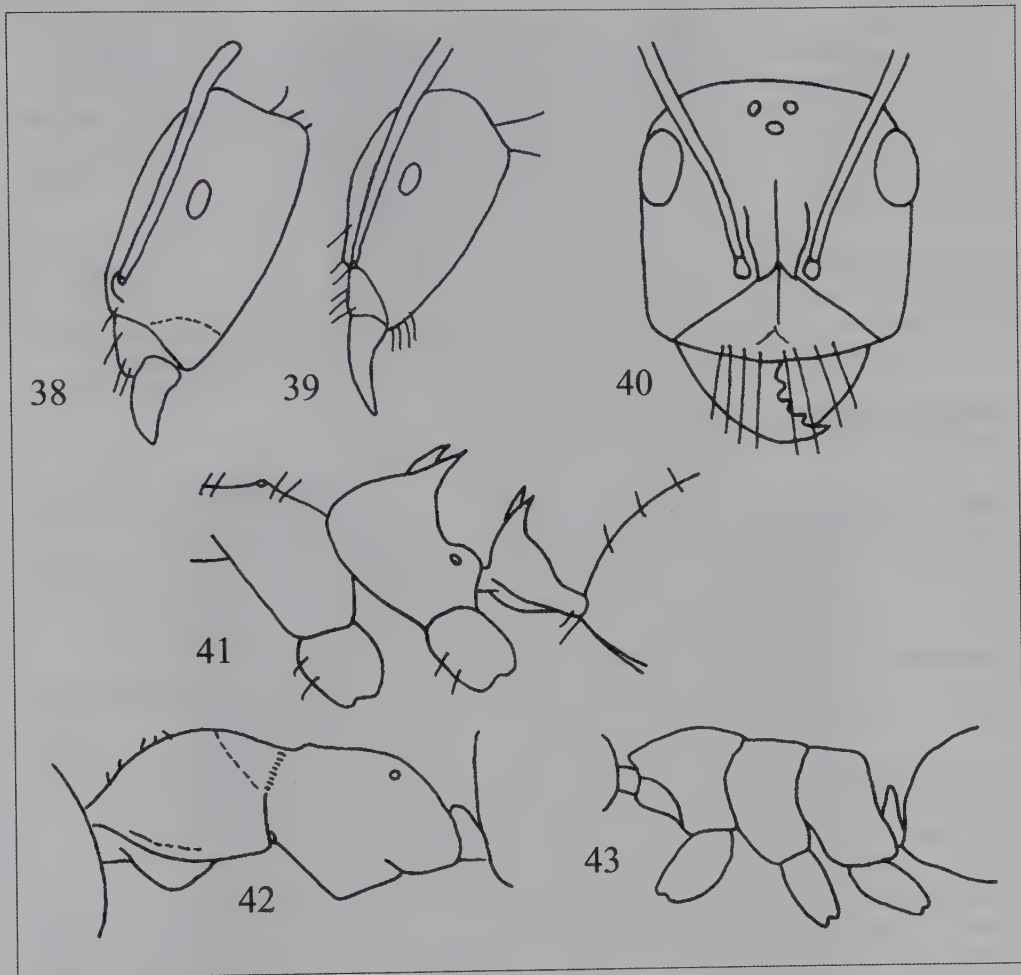
Plates 70–72. *Tetramorium bicarinatum* (Nylander). (Photographs by A. Nobile, © www.antweb.org)



Plates 73–76. *Tetramorium latinode* Collingwood & Agosti. 73: Full face view of head; 74: Head profile. 75: Full face view of head; 76: Head profile. (Photographs from Sharaf & Aldawood, in press).



Plates 77–79. *Tetramorium sericeiventris* Emery. (Photographs by A. Nobile, © www.antweb.org)



Figures 38–43. 38: *Myrmoteras* spec., head in dorsal view; 39: *Camponotus* spec., head; 40: *Cataglyphis* spec., head in dorsal view; 41: *Lepisiota* spec., mid-body and petiole; 42: *Plagiolepis* spec., mid-body; 43: *Anaplolepis* spec., mid-body.

- Ocelli vestigial or absent. Underside of head with short hairs only. Body with stout suberect pairs of hairs *Paratrechina* Motschulsky
- 5 Propodeum bidentate or bituberculate; petiole incised and usually bidentate (Fig. 41) *Lepisiota* Santschi
- Propodeum unarmed, petiole simple 6
- 6 Palp formula 5, 3 or less *Acropyga* Roger
- Palp formula 6, 4 7
- 7 In dorsal view metanotum separated from mesonotum by a deeply impressed suture (Fig. 42) *Plagiolepis* Mayr
- Metanotum not distinguished by sutures; mesapropodeal furrow shallow (Fig. 43) *Anaplolepis* Santschi

***Acropyga* spec.**

Specimens examined: Near Khor Kalba, along highway to Sharjah, stony desert, queen, iii.2006, AvH.

Distribution: Members of this genus are distributed worldwide in tropics and warm temperate. Most species are thought to be hypogaecic and tending both mealybugs and coccids; therefore, they are indirect plant pests. A single queen without wings was collected which is not sufficient to identify it to species rank. This genus is recorded for the first time as occurring in Arabian Peninsula.

***Anoplolepis gracilipes* (F. Smith, 1857)**

Plates 80–82

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: An African species, the ‘yellow crazy ant’ has been introduced into Australia and the Pacific Islands, causing a considerable loss of local biodiversity. New to the UAE.

***Anoplolepis longitarsis* Collingwood & Agosti, 1996.**

Distribution: Described from Saudi Arabia and Yemen. New to the UAE.

***Camponotus acvapimensis* Mayr, 1862**

Plates 83, 115

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: African species, known from Saudi Arabia and Yemen (Socotra). New to the UAE.

***Camponotus adenensis* Emery, 1893**

Specimens examined: 7 km S of al-Jazirat al-Hamra, 8.iii.2005, AvH. Distribution: Described from Aden in Yemen. Also known from Saudi Arabia. New to the UAE.

***Camponotus alii* Forel, 1890**

Specimens examined: Wadi Wurayah, 10.iii.2005, CAC.

Distribution: New to the UAE.

***Camponotus atlantis* Forel, 1890**

Plates 84–85, 116–117

Specimens examined: Al-Ain, 13.iii.2005, CAC. Wadi Safad, 20.xii.2005–2.i.2006, LT, AvH.

Distribution: A common species in North Africa. In the Arabian Peninsula recorded from Saudi Arabia, Oman and Yemen. New to the UAE.

***Camponotus compressus* (Fabricius, 1787)**

Specimens examined: Al-Ain, iii.1995, leg. V. Slijivic.

Distribution: A common Indian species. First recorded from the UAE by Collingwood, Tigar & Agosti (1997).

***Camponotus empedocles* Emery, 1920**

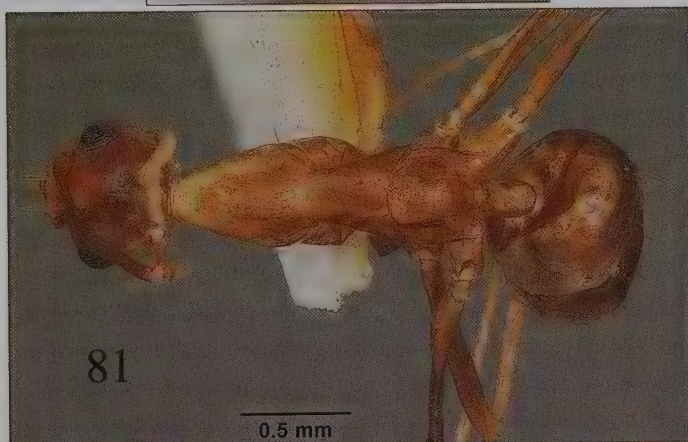
Specimens examined: Al-Ajban, 9.xi–7.xii.2005, LT & MT, AvH. Lahbab-al-Madam, 12.iii.2005, AvH. Sharjah Desert Park, 18–25.i.2005; 22.ii–16.iii.2005, LT, AvH.

Distribution: Described from South Africa. In the Arabian Peninsula known from Saudi Arabia and Yemen. New to the UAE.

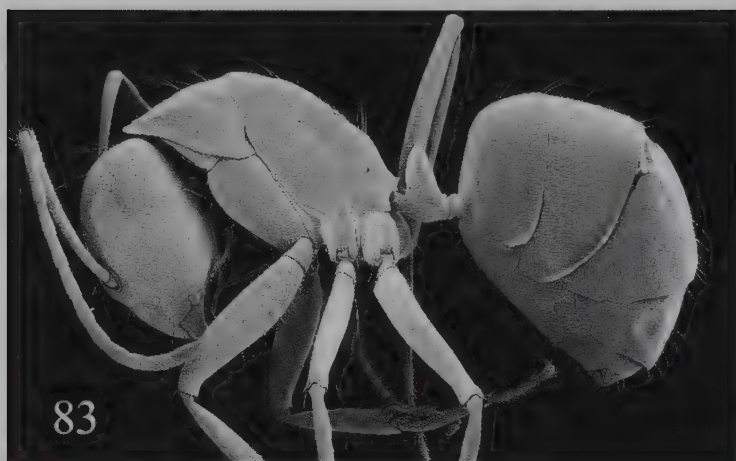
***Camponotus fayfaensis* Collingwood & Agosti, 1996**

Specimens examined: Wadi Safad, 16.iii.2005, CAC.

Distribution: Described from Saudi Arabia. Also known from Yemen. New to the UAE.



Plates 80–82. *Anoplolepis gracilipes* (F. Smith). (Photographs by A. Nobile, © www.antweb.org)



Plates 83–85. 83: *Camponotus acvapimensis* Mayr; 84: *Camponotus atlantis* Forel, small worker; 85: *Camponotus atlantis* Forel, large worker. (Photographs © Fauna of Arabia)

***Camponotus fellah* Dalla Torre, 1893**

Specimens examined: Al-Aslab, 19.ix.2005, at light, AvH. Fujairah, 5.iii–6.iv.2005, LT, AvH. Sharjah Desert Park, 4–5.x.2004, AvH; 14.x.2004, AvH; 9–21.iii.2005, LT, AvH; 21–29.iii.2005, LT, AvH.

Distribution: Occurring from Egypt (type-locality) to Afghanistan. First recorded from the UAE by Collingwood & Agosti (1996), as well as by Tigar & Osborne (1999). In the Arabian Peninsula also known from Kuwait, Saudi Arabia, Oman and Yemen.

***Camponotus flavomarginatus* Mayr, 1862**

Specimens examined: Sharjah Desert Park, 5–6.x.2004, AvH; 3.iii.2005, CAC.

Distribution: In the Arabian Peninsula known from Saudi Arabia, Oman and Yemen. New to the UAE.

***Camponotus nylanderii* Emery, 1921**

Specimens examined: Wadi Madaq, 5.iii.2005, CAC.

Distribution: A European species. New to the UAE.

***Camponotus oasis* Forel, 1890**

Plates 86–87

Specimens examined: Baynunah, iii.1995, CAC. N of Ruwais, 21.iii.1995, leg. D. Agosti. Medinat Zayed, iii.1995, CAC.

Distribution: North African species. First recorded from the UAE (Um az-Zimul) by Collingwood & Agosti (1996). In the Arabian Peninsula also known from Saudi Arabia and Oman.

***Camponotus sericeus* (Fabricius, 1798)**

Specimens examined: Remah, iii.1995, CAC. Sharjah Desert Park, 6.x.2004, AvH; 14.x.2004, AvH.

Distribution: African species, widespread in the Arabian Peninsula. Walker & Pittaway (1987) show the distribution map of *C. sericeus* extending into the UAE.

***Camponotus thoracicus* (Fabricius, 1804)**

Plates 88–89

Specimens examined: Ruwais, 25.iii.1995, leg. D. Agosti. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: North African species, first recorded from the UAE (Baynunah) by Collingwood & Agosti (1996). In the Arabian Peninsula also known from Kuwait, Saudi Arabia, Oman and Yemen.

***Camponotus xerxes* Forel, 1904**

Specimens examined: Al-Ain, iii.1995, CAC. Sharjah Desert Park, 25.i–22.ii.2005, LT, AvH; 3.iii.2005, CAC.

Distribution: Ranges from Central Asia to the Middle East. First recorded from the UAE by Wingate (1992). Also recorded from Merawah Island (Gillett & Gillett, 2002). In the Arabian Peninsula also known from Kuwait, Saudi Arabia and Oman.

***Cataglyphis abyssinicus* (Forel, 1904)**

Specimens examined: Al-Ain zoo, 13.iii.2005, CAC. Ghalilah, 8.iii.2005, CAC. Sharjah Desert Park, 21–29.iii.2005, LT, AvH.

Distribution: Described from Ethiopia, also recorded from Sudan. In the Arabian Peninsula known from Saudi Arabia, Oman and Yemen. New to the UAE.

***Cataglyphis acutinodis* Collingwood & Agosti, 1996**

Specimens examined: NARC, near Sweihan, 14.iii.2005, CAC. Sweihan, iii.1995, CAC.

Distribution: Described from Yemen. Recorded from Abu Dhabi by Tigar & Osborne (1999).



Plates 86–87. *Camponotus oasisium* Forel, from N of Ruwais. (Photographs by D. Agosti)



Plates 88–89. *Camponotus thoracicus* (Fabricius), from Ruwais. (Photographs by D. Agosti)

***Cataglyphis adenensis* (Forel, 1904)**

Plates 90–91

Specimens examined: Hatta-Khor Kalba, 12.iii.2005, CAC. Ruwais, 25.iii.1995, leg. D. Agosti. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Described from Aden in Yemen, also known from Kuwait and Oman. New to the UAE.

***Cataglyphis arenarius* Finzi, 1940**

Plates 92–93

Specimens examined: Ghalilah, 8.iii.2005, CAC. 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH. Remah, resthouse, 18.iii.1995, leg. D. Agosti.

Distribution: Described from Algeria. In the Arabian Peninsula known from Oman. New to the UAE.

***Cataglyphis auratus* Menozzi, 1932**

Specimens examined: Sharjah Desert Park, 29.iii–6.iv.2005, LT, AvH. In *Zygophyllum* desert, iii.1995, CAC.

Distribution: Described from Sudan. In the Arabian Peninsula known from Saudi Arabia. New to the UAE.

***Cataglyphis cana* Santschi, 1925**

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Described from Morocco. New to the UAE.

***Cataglyphis cinnamomeus* (Karawaiew, 1910)**

Specimens examined: NARC, near Sweihan, 14.iii.2005, CAC. Sweihan, iii.1995, CAC.

Distribution: Described from Central Asia, occurring from Afghanistan to Tunisia. Recorded from Abu Dhabi by Tigar & Osborne (1999). In the Arabian Peninsula also known from Saudi Arabia.

***Cataglyphis emmae* (Forel, 1909)**

Specimens examined: Medinat Zayed, iii.1995, in pitfall trap, CAC. Sweihan, in park, iii.1995, CAC.

Distribution: Described from Algeria. In the Arabian Peninsula known from Saudi Arabia. New to the UAE.

***Cataglyphis flavobrunneus* Collingwood & Agosti, 1996**

Plates 94–95

Specimens examined: Sweihan, iii.1995, CAC. NARC, near Sweihan, 23.iii.1995, leg. D. Agosti; 14.iii.2005, CAC.

Distribution: Described from Oman, Saudi Arabia, UAE and Yemen (Collingwood & Agosti, 1996). First recorded from the UAE by Tigar & Collingwood (1993, as *Cataglyphis flavobrunneus* MS). Also recorded by Tigar & Osborne (1999) and Gillett & Howarth (2004).

***Cataglyphis isis* Forel, 1913**

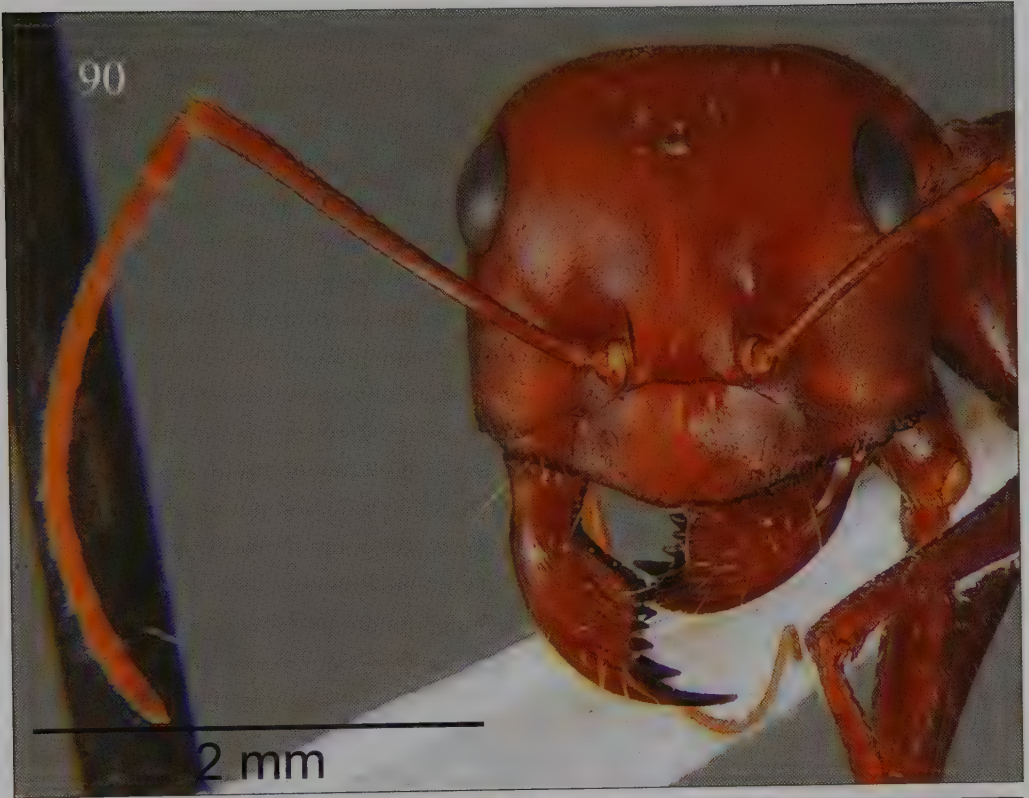
Specimens examined: Al-Ain zoo, 13.iii.2005, CAC.

Distribution: Recorded from Egypt to Afghanistan. In the Arabian Peninsula known from Saudi Arabia and Oman. New to the UAE.

***Cataglyphis laevior* Santschi, 1929**

Specimens examined: Baynunah, iii.1995, leg. B. Tigar. Sharjah Desert Park, 5–6.x.2004, AvH.

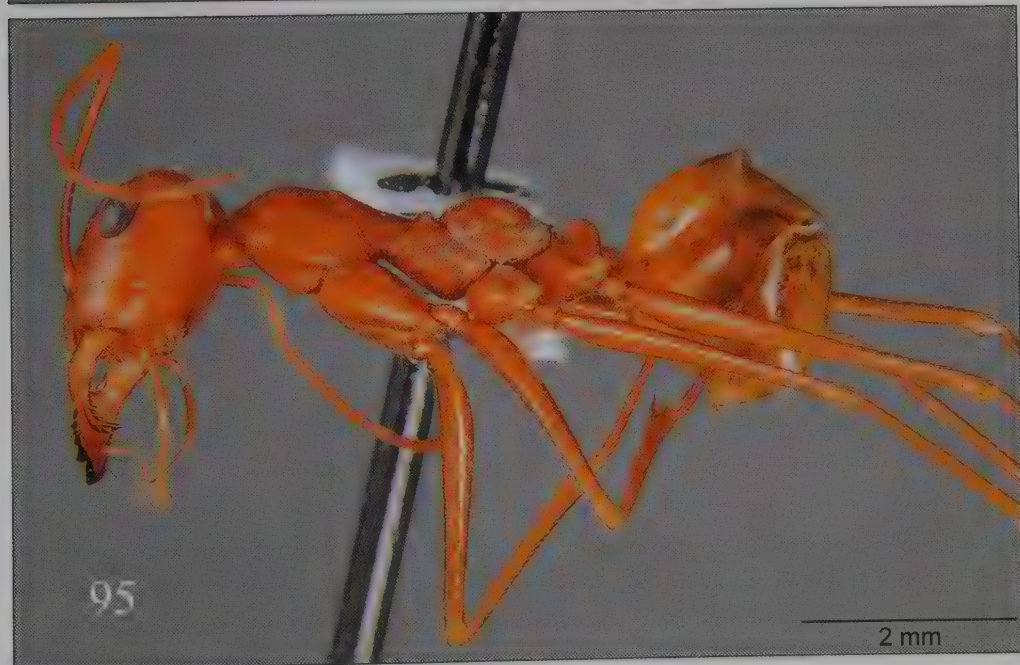
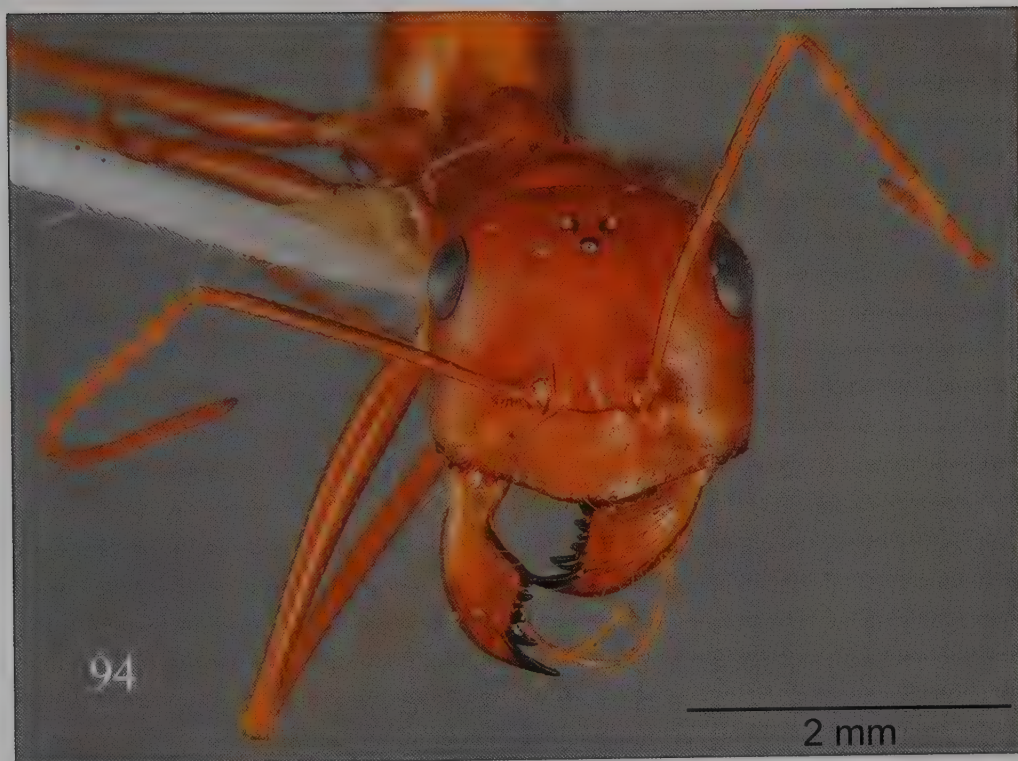
Distribution: First recorded from the UAE by Collingwood & Agosti (1996).



Plates 90–91. *Cataglyphis adenensis* (Forel) from Ruwais. (Photographs by D. Agosti)



Plates 92–93. *Cataglyphis arenarius* Finzi from Remah. (Photographs by D. Agosti)



Plates 94–95. *Cataglyphis flavobrunneus* Collingwood & Agosti from NARC, near Sweihan.
(Photographs by D. Agosti)

***Cataglyphis laylae* Collingwood nov. spec.**

Plates 96–103

Cataglyphis desertorum Forel, 1894, teste Collingwood, 1985; unavailable name according to Agosti (1990).

Specimens examined: Holotype: 1♀, United Arab Emirates, al-Ain [24°13'N 55°46'E], iii.1995, leg. C.A. Collingwood (MHNG). Paratypes: 3♀, al-Ain zoo, 13.iii.2005, CAC. 1♀, Remah, 9.iii.1995, CCA. 3♀, Remah, resthouse, 250 m, irrigated sand dune [24°10'37"N 55°18'6"E], 18.iii.1995, leg. D. Agosti. 6♀, Remah, resthouse, 250 m, irrigated sand dune, nest with one entrance, [24°10'37"N, 55°18'6"E], 18.iii.1995, leg. D. Agosti. 1♀, Sharjah Desert Park, 5–6.x.2004, AvH; 1♀, 3.iii.2005, CAC. 1♀, al-Za'aba, 100 m, sandy soil with *Rhaisa stricta* [23°43'20"N, 55°33'49"E], 22.iii.1995, leg. D. Agosti.

Description: A large worker from al-Ain was selected as holotype. The measurements are as follows: total length 8.40; head width 3.60; head length 4.20; scape length 3.84; funicular segment I 0.40; funicular segment II 0.23; petiole length 1.10; petiole width 0.72. Colour dark reddish brown. There are no exterior hairs on the scapes or hind tibia. The gaster, petiole and propodeum have dorsal hairs.

Remarks: This species thought to correspond with *C. desertorum* has to be described as a new species. In fact it is one of the commonest *Cataglyphis* in southern Arabia. The main distinguishing feature compared with other dark *Cataglyphis* is the slender petiole, which has the anterior face more sloped than in other similar species such as *C. niger* (André, 1882) and *C. savignyi* (Dufour, 1862).

Biology: *Cataglyphis laylae* nov. spec. does not appear to occur in open sandy desert and is most abundant in disturbed habitats such as man-developed plantations and open cultivated fields.

Distribution: This species was recorded by Collingwood (1985) as *C. desertorum* from Saudi Arabia and Oman and as *Cataglyphis* spec. by Collingwood & Agosti (1996).

Etymology: The new species is named after a village settlement called "Layla", just north of Riyadh (Saudi Arabia) in the area where the author (CAC) first encountered it in numbers in an *Acacia* plantation.

***Cataglyphis lividus* (André, 1881)**

Specimens examined: Sharjah Desert Park, 3.iii.2005, CAC. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Middle East and North Africa. Already recorded from the UAE by Tigar & Collingwood (1993), Collingwood & Agosti (1996), Tigar & Osborne (1999) and Gillett & Howarth (2004). In the Arabian Peninsula also known from Kuwait, Saudi Arabia, Oman and Yemen.

***Cataglyphis minimus* Collingwood, 1985**

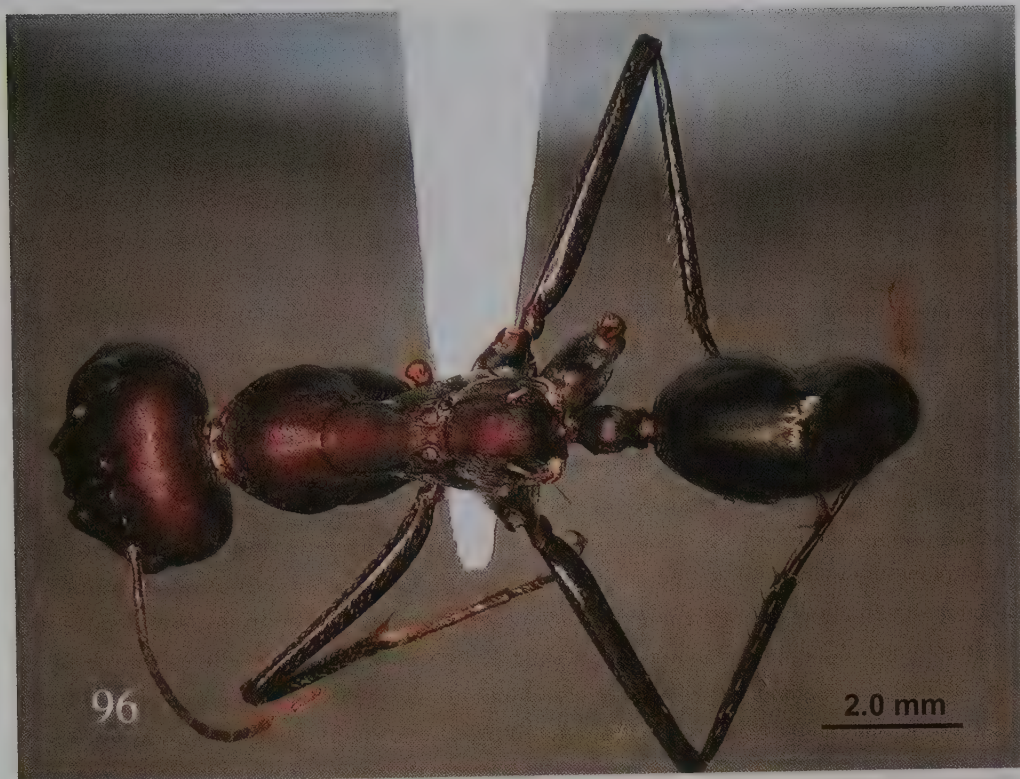
Specimens examined: NARC, near Sweihan, 14.iii.2005, CAC. Ghalilah, 8.iii.2005, CAC. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Described from Saudi Arabia. Recorded from Ras Ghanada by Tigar & Collingwood (1993) and by Collingwood & Agosti (1996).

***Cataglyphis niger* (André, 1881)**

Specimens examined: Wadi Safad, 26.xii.2005–2.i.2006, WT, AvH.

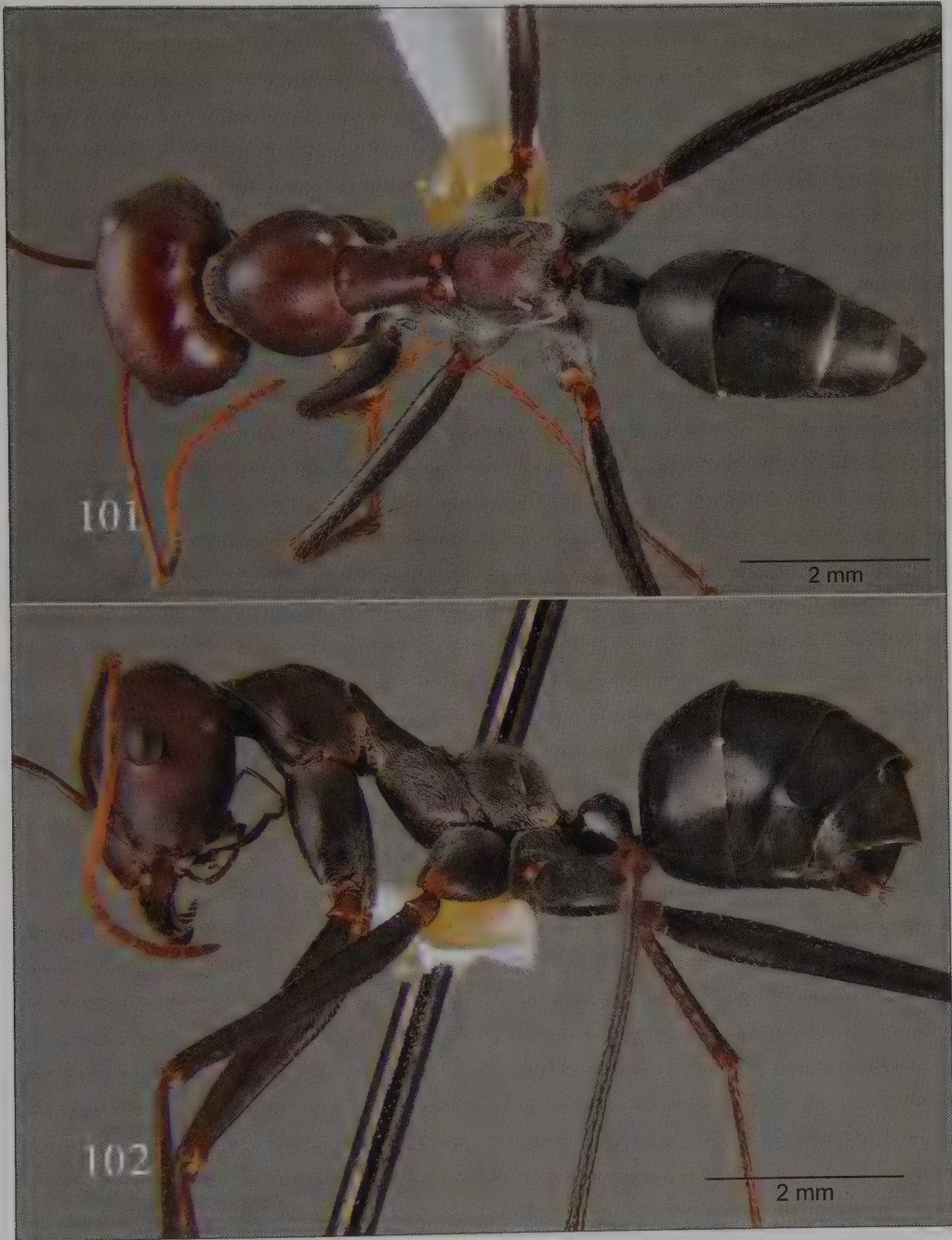
Distribution: Species from the Middle East. Recorded from the UAE by Wingate (1992), Tigar & Collingwood (1993) and Gillett & Gillett (2002, from Merawah Island). Walker & Pittaway (1987) show the distribution map of *C. niger* extending into the UAE.



Plates 96–97. *Cataglyphis laylae* Collingwood nov. spec., holotype. 96: Habitus, dorsally; 97: Habitus, laterally. (Photographs by P.J. Attawell)



Plates 98–100. *Cataglyphis laylae* Collingwood nov. spec., holotype. 98: Head, dorsally; 99: Head, laterally; 100: Mid-body. (Photographs by P.J. Attawell)



Plates 101–102. *Cataglyphis laylae* Collingwood nov. spec., paratype from al-Za'aba. 101: Lateral view; 102: Propodeum and petiole. (Photographs by D. Agosti).



Plate 103. *Cataglyphis laylae* Collingwood nov. spec., paratype from al-Za'aba, head in dorsal view. (Photograph by D. Agosti)

***Cataglyphis nodus* (Brullé, 1832)**

Specimens examined: Al-Ain zoo, 13.iii.2005, CAC.

Distribution: European species, the largest European *Cataglyphis*. New to the UAE.

***Cataglyphis ruber* (Forel, 1903)**

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Described from Algeria, occurring along the southern border of the Mediterranean. In the Arabian Peninsula known from Saudi Arabia and Oman. New to the UAE.

***Cataglyphis sabulosus* Kugler, 1981**

This species was described from Egypt and Palestine. Recorded from the UAE by Tigar & Collingwood (1993), Collingwood & Agosti (1996), Tigar & Osborne (1999) and Gillett & Howarth (2004). Also known from Saudi Arabia and Oman. No new collections.

***Cataglyphis savignyi* (Dufour, 1862)**

Specimens examined: Sharjah Desert Park, 3.iii.2005, CAC.

Distribution: Recorded from countries at the northern fringe of the Sahara desert. In the Arabian Peninsula known from Oman and Yemen. New to the UAE.



Plates 104–105. *Cataglyphis urens* Collingwood, 1985, from Remah. (Photographs by D. Agosti)



Plate 106. *Cataglyphis viaticoides* (André) from S of Abu Dhabi (Photograph by D. Agosti)

***Cataglyphis urens* Collingwood, 1985**

Plates 104–105

Specimens examined: Remah, resthouse, 250 m, irrigated sand dune [24°10'37"N 55°18'6"E], 18.iii.1995, leg. D. Agosti. Sharjah Desert Park, 3.iii.2005, CAC.

Distribution: Described from Saudi Arabia and Oman. Recorded from Madinat Zayed and Merawah Island by Collingwood & Agosti (1996).

***Cataglyphis viaticoides* (André, 1881)**

Plates 106–107

Specimens examined: S of Abu Dhabi, 24.15N 5429E, 24.iii.1995, leg. D. Agosti.

Distribution: This species was described from Lebanon; also known from Turkey. New to the UAE.

Lepisiota elegantissima* Collingwood & van Harten *nov. spec.

Plates 108–109

Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Madaq [25°18'N 56°07'E], 26.x–9.xi.2006, in yellow and white water traps, leg. A. van Harten (NHML). Paratypes: 5♀, same data as holotype but in Liverpool Museum; 1♀, same data but 15–31.x.2010. Three workers collected from Malaise trap at Wadi Wurayah, 18–25.iii.2007, are in alcohol and were not included in the type series.

Description: Head and gaster black, midbody and petiole yellowish brown. Legs and antennae yellow, the apical parts of mid and hind femora are suffusedly blackish. Surface sculpture dull, finely reticulate. Petiole long with very short blunt lateral processes (teeth). Propodeum



Plate 107. *Cataglyphis viaticoides* (André) from S of Abu Dhabi (Photograph by D. Agosti)

with a pair of fine upright teeth. Mesonotum tube-like, very thin, narrow and long relative to pronotum and propodeum.

Measurements (in mm): Total length 4.25–4.60; head length 0.80–0.82; head width 0.46–0.61, scapus length 2.0, eye diameter 0.23, petiole width 0.16; petiole length 0.56; propodeal teeth 0.09; mesonotal width 0.16; mesonotal length 0.24; hind tibia 2.04; pronotum 0.90 long, 1.46 wide. Scape index 4.44 (excessively long in comparison to other species). No dorsal hairs except for a few on clypeus and some very short hairs on petiole.

Differential diagnosis: An elegant elongate species with long legs and antennae, differing from *L. arenaria* and *L. longinoda* by its blunt petiole and long narrow mid-body.

Etymology: The species epithet *elegantissima* is derived from 'elegans', Latin for elegant, meaning most elegant, referring to the shape of this very beautiful species.

***Lepisiota gracilicornis* (Forel, 1892)**

Specimens examined: 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH.

Distribution: Sudan, Eritrea, Ethiopia. New to the UAE.

***Lepisiota karawaiewi* (Kuznetsov-Ugamsky, 1929)**

Specimens examined: Al-Aslab, 19.ix.2005, at light, AvH. Sharjah, 8–9.x.2004, AvH. Sharjah Desert Park, 14.x.2004, AvH.



Plates 108–109. *Lepisiota elegantissima* Collingwood & van Harten nov. spec. 108: Holotype, lateral view (Photograph by C. van Achterberg); 109: Paratype, frontal view (Photograph by P.J. Attewell)

Distribution: Common in the southern Greek islands. Also known from Kuwait. New to the UAE.

***Lepisiota nigra* (Dalla Torre, 1893)**

Specimens examined: Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Occurs in south-eastern Europe. In the Arabian Peninsula known from Oman. New to the UAE.

***Lepisiota nigrescens* Karavaiew, 1912**

Distribution: First recorded from the UAE by Tigar & Collingwood (1993); also recorded by Collingwood & Agosti (1996). No specimens have been collected recently.

***Lepisiota opaciventris* (Finzi, 1936)**

Specimens examined: Sharjah, 8–9.x.2004, AvH. Sharjah Desert Park, 14.x.2004, AvH. Wadi Safad, 26.xii.2005–2.i.2006, WT, AvH.

Distribution: Only known from Egypt, Israel, Saudi Arabia, Oman and Yemen. New to the UAE.

***Myrmoteras* cf. *indica* Moffett, 1985**

Specimens examined: Sharjah Desert Park, males, 29.iii–6.iv.2005, LT, AvH.

Distribution: Probably an Indian species, introduced with imported plant material.

***Paratrechina flavipes* (F. Smith, 1874)**

Specimens examined: 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH. Sharjah, 10–17.x.2004, AvH. Sharjah Desert Park, 5–6.x.2004, AvH.

Distribution: Native to East Asia, but widely spread. Recorded from the UAE by Collingwood & Agosti (1996) and Collingwood, Tigar and Agosti (1997). Also known from Oman.

***Paratrechina jaegerskjoeldi* Mayr, 1904**

Specimens examined: Abu Dhabi, iii.1995, CAC. Al-Ain, iii.1995, CAC. Sharjah Desert Park, 14.x.2004, AvH.

Distribution: Tramp species, abundant in many parts of the Middle East. Recorded from Abu Dhabi, al-Ain and Khor Kalba by Collingwood, Tigar & Agosti (1997). Also known from Saudi Arabia, Oman and Yemen.

***Paratrechina longicornis* (Latreille, 1802)**

Plates 110–110, 116, 117

Specimens examined: Al-Ain, iii.1995, CAC. Al-Madam, iii.1995, CAC. Ruwais, iii.1995, CAC. Sharjah, 8–17.x.2004, AvH. Sharjah Desert Park, 5–6.x.2004, AvH; 14.x.2004, AvH.

Distribution: The 'longhorn crazy ant' is possibly the most widespread of all tramp species (Wetterer, 2008). First recorded from the UAE by Collingwood, Tigar and Agosti (1997). Also known from Saudi Arabia, Oman and Yemen.

***Paratrechina vividula* (Nylander, 1846)**

Specimens examined: Al-Ain zoo, 13.iii.2005, CAC. Sharjah Desert Park, 5–6.x.2004, AvH.

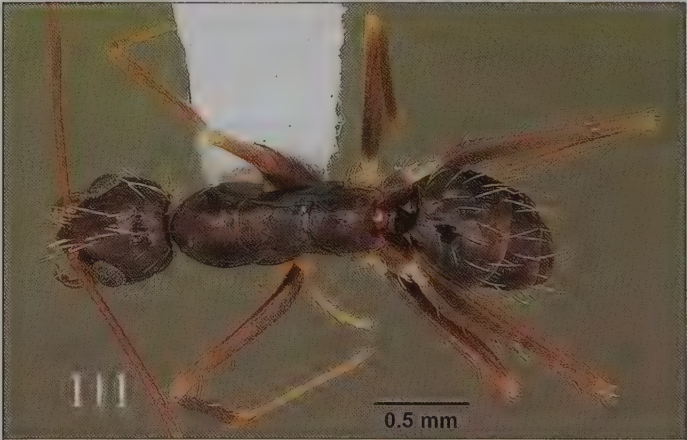
Distribution: Widespread tramp species. New to the UAE.

***Plagiolepis exigua* Forel, 1894**

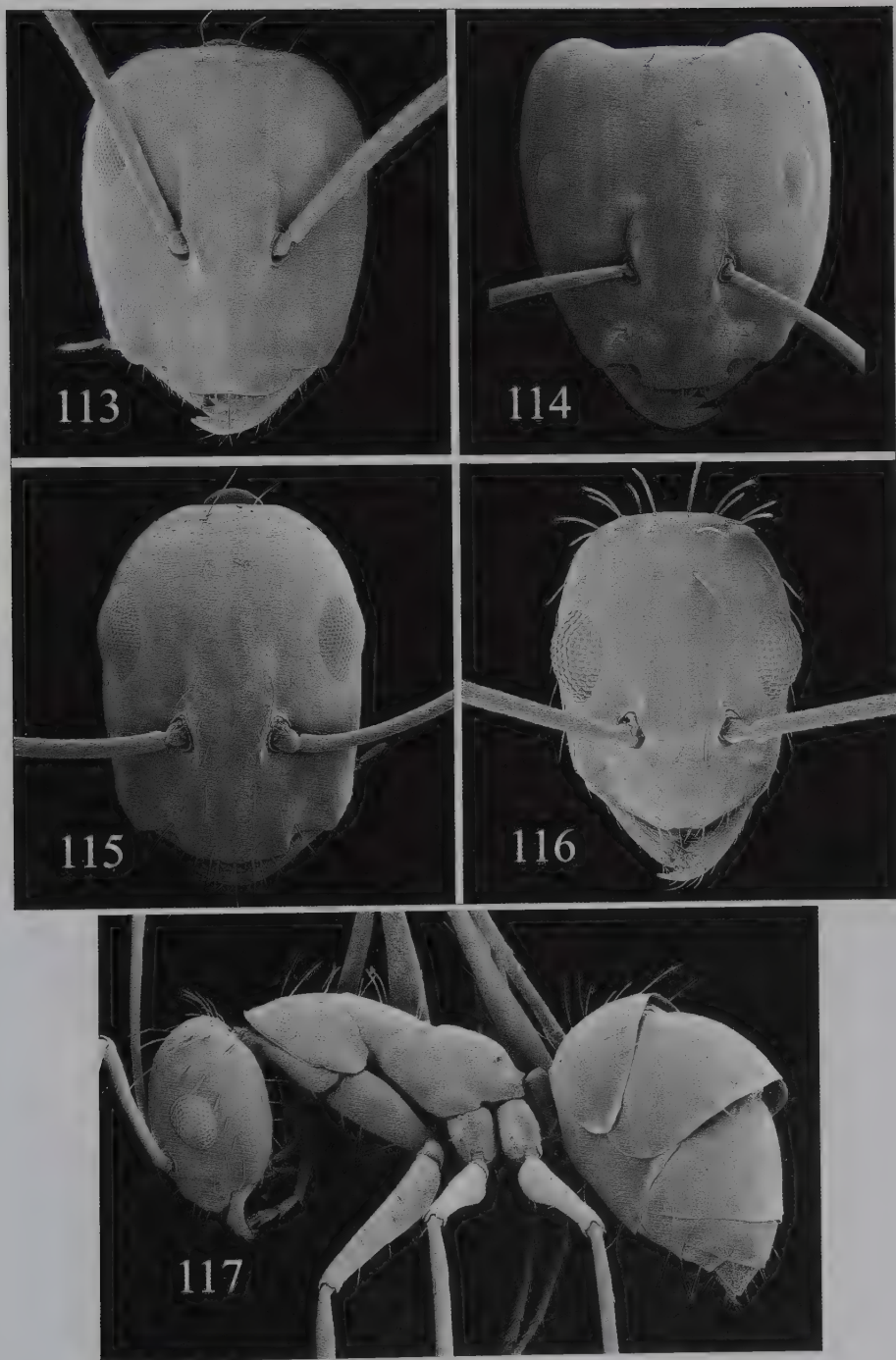
Plates 118–120

Specimens examined: 7 km S of al-Jazirat al-Hamra, 9.x.2004, AvH; Al-Wathba Wetland Reserve, 14.iii.1995, CAC.

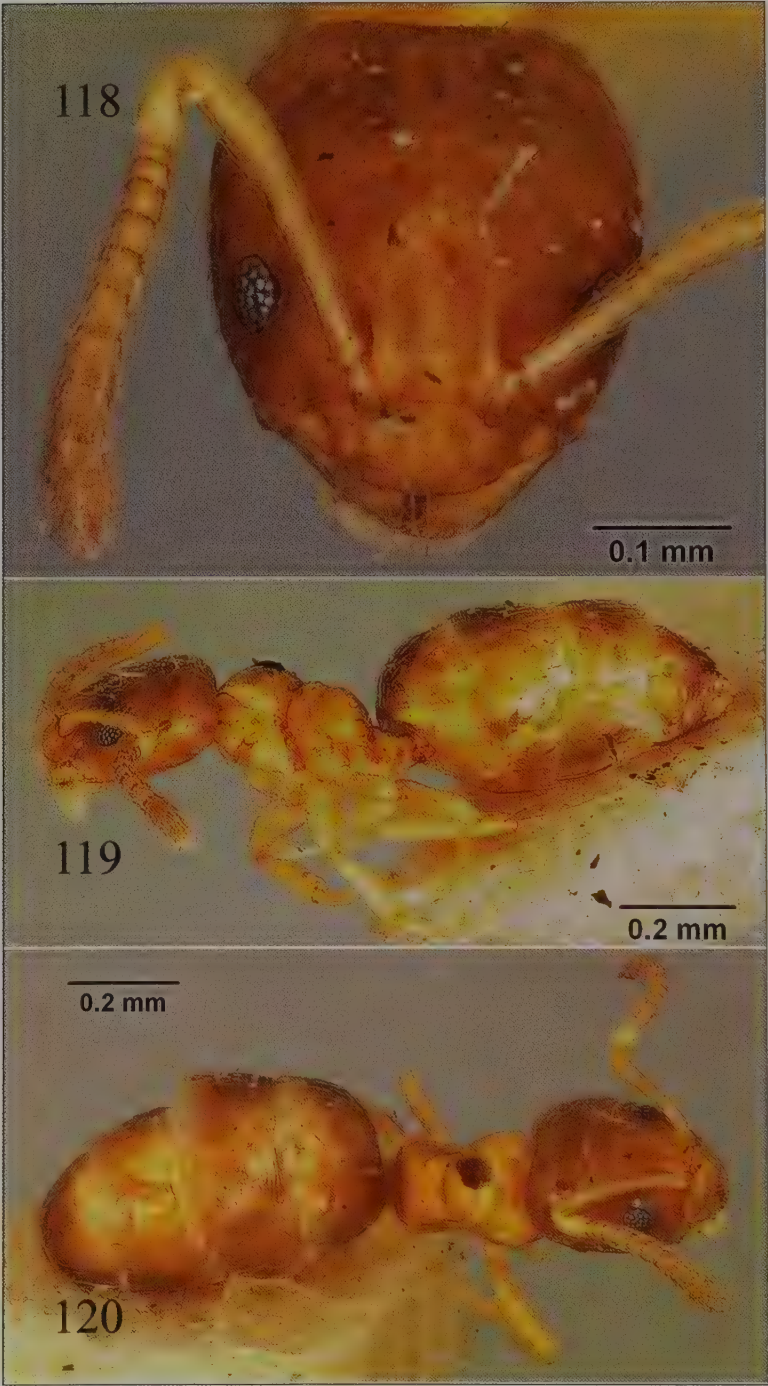
Distribution: Cosmopolitan species. In the Arabian Peninsula known from Saudi Arabia and Yemen. New to the UAE.



Plates 110–112. *Paratrechina longicornis* (Latreille). (Photographs by A. Nobile, © www.antweb.org)



Plates 113–117. 113–116. Heads. 113: *Camponotus acvapimensis* Mayr; 114: *Camponotus atlantis* Forel, small worker; 115: *Camponotus atlantis* Forel, large worker. 116: *Paratrechina longicornis* (Latreille); 117: *Paratrechina longicornis* (Latreille), habitus. (Photograph © Fauna of Arabia)



Plates 118–120. *Plagiolepis exigua* Forel. (Photographs by M. Esposito, © www.antweb.org)



Plates 121–122. *Polyrhachis lacteipennis* F. Smith from Oman. (Photographs by D. Agosti)

***Polyrhachis lacteipennis* F. Smith, 1858**

Plates 121–122

Specimens examined: Abu Dhabi, in park, iii.1995, CAC. Sharjah, 8–9.x.2004, AvH. Sharjah Desert Park, 5–6.x.2004, AvH. Al-Wathba Wetland Reserve, 14.iii.2005, CAC.

Distribution: Recorded from the Indian subcontinent and the Middle East. In the Arabian Peninsula known from Saudi Arabia, Oman and Yemen. New to the UAE.

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Authors' addresses:

C.A. Collingwood, 18 Milton Street, Skipton, North Yorkshire BD23 2ED, United Kingdom; e-mail: cedcollingwoodants@yahoo.co.uk

Dr. D. Agosti, Embassy of Switzerland, Elahieh, Ave. Sharifi Manesh, Tehran 19649, Iran; e-mail: agosti@amnh.org

Dr. M. R. Sharaf, Plant Protection Department, College of Food Sciences and Agriculture, King Saud University, P.O. box 2460, Riyadh 11451, Saudi Arabia; e-mail: antsharaf@yahoo.com

A. van Harten, UAE Insect Project, P.O. Box 63799, Sharjah, United Arab Emirates; e-mail: tonyvanharten@gmail.com

Order Hymenoptera, family Ampulicidae

Michael Ohl

INTRODUCTION

Ampulicidae, or cockroach wasps, with reference to their prey, are a small group of digger wasps of mainly tropical distribution. A few species like *Ampulex compressa* (Fabricius, 1781), the ‘emerald cockroach wasp’ or ‘jewel wasp’, are frequently bred in captivity due to its showy metallic colouration and attractive behaviour as a cockroach parasite (e.g. Veltmann & Wilhelm, 1991).

Ampulicidae is considered to represent the sister group to all 30.000+ species of Apoidea (bees and the paraphyletic Sphecidae sensu Bohart & Menke, 1976), or to be one of its basalmost lineages (Ohl & Spahn, 2010). About 200 species are currently known worldwide (Pulawski, 2010), but most parts of the world are in need of taxonomic revisions.

Within Apoidea, Ampulicidae can be readily identified by the combination of bifid or toothed tarsal claws, two midtibial spurs and the hindwing jugal lobe small or even absent. Other distinctive but variable features are the generally elongate body with long, slender legs, which are used for the running-jumping behavior, usually deeply impressed, long notauli, and an elongate, angular propodeum, with posterolateral tooth-like projections. Most *Ampulex* and *Trirogma*, including the Arabian species are distinctive by their blue-purple metallic body colouration. *Dolichurus* and all other ampulicid genera are largely black, in some species with white or red markings.

Many Ampulicidae exhibit a typical running-jumping behavior. They are very swift-moving and are frequently overlooked by collectors. As a consequence, species of Ampulicidae are essentially rare in collections until recently, when improved collecting methods (particularly Malaise traps) have revealed a remarkable amount of material even from remote areas of the world. This was also the case in the UAE and other Arabian countries. As an example, the genus *Dolichurus* has not been recorded from Arabia yet (except for being included in the key to Arabian apoid wasp genera by Guichard, 1986). The insect survey of the United Arab Emirates by A. van Harten resulted in more than 30 specimens of this genus, all collected in Malaise traps.

However, although the number of specimens of *Dolichurus* recently collected in Arabia is rather high as compared to the lack of any previous record, the total number of specimens of the family recorded from Arabia is still quite low. Based on a thorough search for specimens from Arabia in most of the relevant collections of the world and including the rich Malaise trap residues from the UAE provided by A. van Harten, less than 50 specimens of Ampulicidae representing four species could be found in total. Although the relatively small number of specimens from Arabia is likely to be a collecting artefact, the total number of Arabian species of Ampulicidae is probably very low.

MATERIALS AND METHODS

The terminology generally follows Bohart & Menke (1976), with some additions for Ampulicidae by Ohl & Spahn (2004) and particularly for *Dolichurus* by Ohl (2002) and Ohl et al. (2004). The crossvein between submarginal cell I and II in the forewing, which is obliterated in *Ampulex assimilis*, has been named the first intersubmarginal vein by Prentice (1998), which I adopt here.

Digital images were taken und modified using multilayer digital photography (Leica® DFC 490 digital camera on a Leica® Z16 ApoA with the software package Automontage by Syncroscopy®).

The specimens from the UAE are deposited in the California Academy of Sciences, San Francisco, USA (CAS), the personal collection of Christian Schmid-Egger, Berlin, Germany (CSE), the National Natural Historical Museum Naturalis, Leiden, the Netherlands (RMNH), the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (SDEI), the United Arab Emirates Insect Collection (UAEIC), the Bohart Museum of Entomology, University of California, Davis, USA (UCD), and the Museum für Naturkunde, Berlin, Germany (ZMB).

SYSTEMATIC ACCOUNT

Key to genera and species of Ampulicidae from the Arabian Peninsula

1. Antennal base each with overhanging frontal lobe; lobe with distinct lateral carina. Apex of marginal cell curving away from wing margin. Metasternum Y-shaped with posterior arms markedly elongate. Petiole inserted between and on same level as hindcoxae *Ampulex* 2
- Antennal bases together overlaid by single frontal platform, which might be medially depressed. Apex of marginal cell ending on wing margin. Metasternum emarginate posteriorly, but not with markedly elongate posterior arms. Petiole inserted above and somewhat behind hindcoxae 3
2. Forewing with three complete submarginal cells. Mid and hindfemur red. Body length 19–24 mm *Ampulex compressa* (Fabricius)
- First intersubmarginal vein completely or almost completely obliterated, so forewing with apparently two submarginal cells. Legs completely metallic blue. Body length 10–18 mm *Ampulex assimilis* Kohl
3. Black, or black and red. Frontal platform shallowly concave. Forewing submarginal cell I about as long on media as submarginal cell II. Hindwing media diverging before cu-a *Dolichurus arabicus* nov. spec.
- Metallic blue. Frontal platform with markedly deep longitudinal groove. Forewing submarginal cell I on media more than twice as long as II. Hindwing media diverging after cu-a *Trirogma caerulea* Westwood

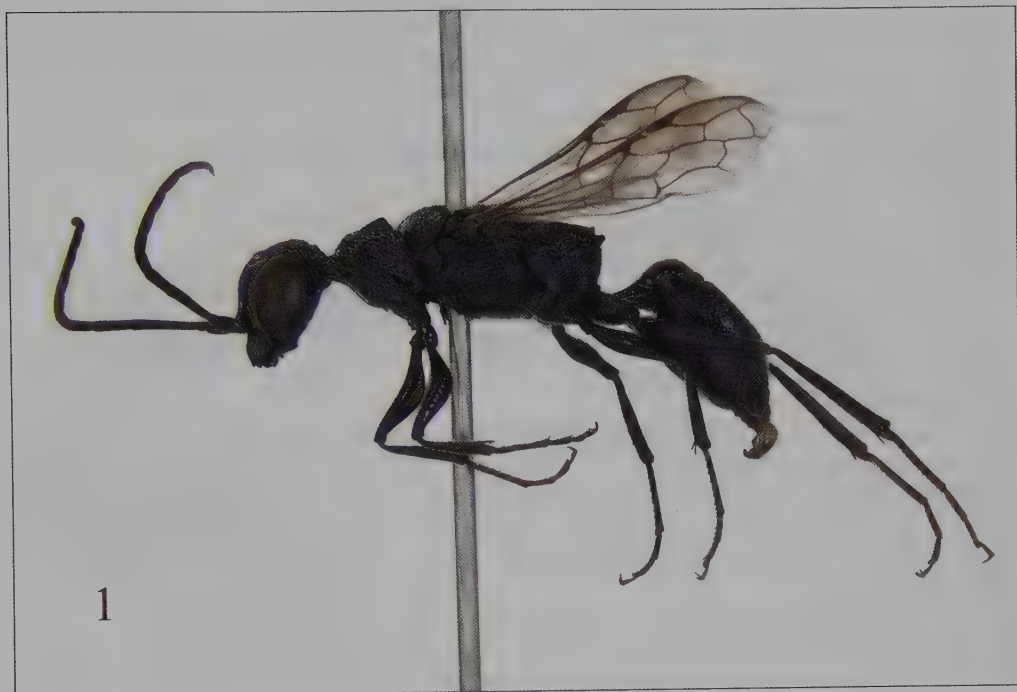
Genus *Ampulex* Jurine, 1807

Ampulex assimilis Kohl, 1893

Plates 1–2

Ampulex assimilis Kohl, 1893: 464, ♀. Lectotype: ♀, Iraq, Baghdad (NHMW), designated by de Beaumont, 1970: 395. – Morice, 1921: 76 (Iraq: Amara; description of male); de Beaumont, 1961: 2 (Iraq); Bohart and Menke, 1976: 77 (listed); Al-Ali, 1977: 92 (Iraq: Baghdad); Guichard, 1980: 224 (Oman: Rostaq).

Specimens examined: Al-Ajban, 2♂, 17–24.iv.2006, Malaise trap, leg. A. van Harten; 1♂, 9.iv–2.v.2006, Malaise trap, leg. A. van Harten. Hatta, 1♂, 20.x.1981, leg. C.G. Roche; 1♂, 13.xi.1981, leg. C.G. Roche (CAS, not personally examined but confirmed by W.J. Pulawski). OMAN: Northern Oman, Rostaq (Guichard, 1980: 224). Al-Buraimi [followed by "des Alfaya" but partly illegible], 2♀, 25.iv.1992, leg. S. A'Sahmsi (coll. University Muscat). Al-Amraat, 1♀, 15.iii.1990 (coll. University Muscat). Al-Hail, 1♀, 13.ii.1992, leg. A. Kadil (coll. University Muscat). Nizwa Wat., Jabal Al-Akhdar, Saiq, 1♂, 2.vii.1992, leg. H. Al-Nabhani (coll. University Muscat).



Plates 1–2. *Ampulex assimilis* Kohl, male, al-Ajban, UAE. 1: Lateral view; 2: Dorsal view.

Diagnosis: Within Arabian Ampulicidae, *Ampulex assimilis* is unique in having submarginal cells I and II fused, so that the forewing has apparently two submarginal cells only. Additionally, *A. assimilis* is the only Arabian ampulicid with a totally metallic-blue body colouration (tibiae and tarsi might be tinged with black).

Distribution: UAE (new record), Oman, Iraq. Recorded from Oman (Northern Oman, Rostaq) by Guichard (1980: 224)

***Ampulex compressa* (Fabricius, 1781)**

Plates 3–4

Sphex compressus Fabricius, 1781: 445, sex not indicated (as *compressa*, incorrect original termination).

Holotype or syntypes: India: Kerala: Malabar (BMNH).

Ampulex sinensis de Saussure, 1867: 43, ♂. Holotype or syntypes: ♂, China: Hong Kong (NHMW).

Chlorampulex striolata de Saussure, 1892: 446, ♀. Holotype or syntypes: ♀, Tanzania: Zanzibar: no specific locality (MHNG).

Specimens examined: None.

Diagnosis: *Ampulex compressa* can be readily identified by the combination of metallic blue, green or purple body colouration and non-metallic red mid- and hindfemora.

Distribution: Native of the Oriental and perhaps the Ethiopian region. *Ampulex compressa* has been (accidentally or intentionally) introduced to many countries and islands over the world (see e.g. Menke & Yustiz, 1983). However, the Arabian records are within the area of the original distribution.

Previous Arabian records of *Ampulex compressa* are from Yemen (Guiglia, 1964) and Saudi Arabia (Gadallah & Assery, 2004). None of the specimens were available for study, but upon my request, Neveen Gadallah re-examined the specimen from Saudi Arabia and confirmed its identity.

Genus ***Dolichurus*** Latreille, 1809

***Dolichurus arabicus* Ohi nov. spec.**

Plates 5–10

Specimens examined: Holotype: ♂, United Arab Emirates, al-Ajban, 24°36'N 55°01'E, 9.iv–2.v.2006, Malaise-trap, leg. A. van Harten (ZMB). Paratypes: 7♂, same data as holotype; 7♂, 7♀, same data as holotype but 7–28.xii.2005, 26.ii–2.iv.2006, 25.iii–2.iv.2006, 1.iv–2.v.2006, 9–16.iv.2006, 26.vi–25.vii.2006, 25.vii–7.viii.2006, 7–21.viii.2006. 1♀, Hatta, light trap, 8–26.iv.2006, leg. A. van Harten. 2♀, Wadi Madaq, Malaise trap, 19.x–16.xi.2006, 16.xi–26.xii.2006, leg. A. van Harten. 1♂, Bithnah, 19.x–16.xi.2006, Malaise trap, leg. A. van Harten. 3♂, Nakhali, Dubai, 28–30.iv.1984, 10.v.1984, leg. E.A. Sugden; 3♂, same data but 15–18.iv.1984. 25–28.iv.1984, Malaise trap. 2♀, Wadi Bih dam, 24.iii.2009, leg. A. van Harten. 2♂, Wadi Wurayah, 1–8.iv.2009, Malaise trap, leg. A. van Harten. OMAN: Wadi near Al-Ghul, S Nizwa, 22°53.04'N 57°31.12'E, 1♂, 16.xii.2003, leg. M. Ohi. Paratypes in CAS, CSE, RMNH, UAEIC, UCD, and ZMB

Diagnosis: *Dolichurus arabicus* nov. spec. is the only representative of the genus in Arabia. Females can be readily identified by the combination of predominantly orange mandibles, relatively dark tibiae, tarsi and antenna, lower mesopleuron irregularly punctured and with large shining interspaces of more than 1 puncture diameter, and tergum III about half red. The African *D. foroforo* Ohi, Fritz & Neumann, 2004 (Senegal to Ethiopia and Kenya) is most similar, but it has the lower mesopleuron densely, irregularly punctatorugose without markedly developed interspaces, and tergum III only narrowly red (not more than 0.25 tergal length). Additionally, tarsi, tibiae and antenna are markedly orange at least on the ventral face, with the dorsal side darker to a varying extent. In contrast, females of *D. arabicus* have the tibiae, tarsi and antenna pale to dark brown, with the dorsal face even darker.



Plates 3–4. *Ampulex compressa* (Fabricius), female, Indonesia. 3: Lateral view; 4: Dorsal view.

Males of *D. arabicus* have most of the mandibles, the anterior margin of the frontal platform, the antennae and the legs orange-yellow. The pronotal collar has two white markings on the lateral tubercles. This colour pattern is shared with *D. forofo*, which differs from *D. arabicus* by the vertex punctation which is sparse and shallow in *D. forofo* (punctures generally more than one diameter apart). In *D. arabicus*, the vertex punctation is also relatively shallow, but much denser (punctures generally less than one diameter apart).

Another species which geographically occurs close to Arabia is *D. haemorrhous* A. Costa, 1886. It was recorded from Gizeh, Egypt, by Pulawski (1964). The female of *D. haemorrhous* has tergum III almost totally black (half red in *D. arabicus*), terga I–III virtually impunctate (terga I–III with lateral patches of dense, coarse punctation), and the face below midocellus markedly sparsely punctate with large shiny areas (face densely punctatorugose throughout, also immediately below midocellus).

Description: Female: Black. The following are orange-yellow: Mandible (tip and base narrowly black), anterior clypeal margin, and about half of metasomal segment III and IV–VI completely. Tibiae, tarsi and antenna pale to dark brown. Forewing yellowish, hindwing almost hyaline. With six pairs of black, prominent macrosetae, one pair each on mandible, lateral portion of clypeus, median lobe of clypeus, on frons at base of frontal platform, on vertex laterally of ocelli, and on pronotal collar. Mandible tridentate. Clypeus almost shiny and asetose (except for macrosetae), free median clypeal lobe rather narrowly protruding, clypeal disk evenly convex, with an indistinct longitudinal median carina. Frons laterally of frontal platform obscured by dense silvery pubescence. Frontal platform broad, about as twice scapal width, anterior and lateral margin markedly bulging and shiny. Scape with sharp, shiny carina on ventral side. Flagellomere I $1.1\text{--}1.2\times$ as long as II, length of flagellomeres II–IV subequal, following flagellomeres becoming progressively shorter. Frons from base of frontal platform to level of lateral ocelli irregularly punctatorugose, rugulae more or less oriented to midocellus. Vertex sparsely and irregularly punctate behind lateral ocelli, punctures becoming markedly denser posterad. Pronotal collar transversely carinate anteriorly, irregularly, shallowly punctured posteromedially. Pronotal tubercle sparsely, shallowly punctured, shiny. Pronotal sides coarsely, longitudinally wrinkled. Scutum and scutellum sparsely punctured, shiny, punctures generally more than 2 diameters apart, denser laterally. Ocular sulcus, acetabular sulcus, sternaulus, and scrobal sulcus coarsely pitted, complete. Ocular and acetabular sulcus accompanied by a carina anteriorly. Metanotum irregularly rugose. Metapleuron shiny, with a few coarse carinae in upper part, in some specimens with faint longitudinal carinae in lower part. Metapostnotum with five longitudinal carinae, posteriorly delimited by lamellate carina. Propodeal sides with lamellate carina dorsally. Propodeal hindface irregularly, coarsely rugose; laterally delimited by irregular carina, which terminates posteriorly in a tooth-like projection. Tergum I densely punctatorugose laterally, in most specimens markedly larger and closer than lateral punctures on tergum II, which are delimited to a relatively small area. Lateral tergal punctation progressively sparser and shallower from tergum II to IV.

Body length 6.2–8.9 mm; forewing length 3.1–4.6 mm; length-width ratio of flagellomere I 4.8–5.1; ratio of lower to upper interocular width 1.1; ratio of distance between lateral ocellus to eye margin to midocellar diameter 0.9–1.1.

Male: Black. The following are orange-yellow: Mandible (tip and base narrowly black), apical margin of frontal platform, tibiae, tarsi, and antenna. Most specimens with white spot on pronotal tubercle. Forewing yellowish, hindwing almost hyaline.

Mandibular base, clypeus, lower face up to level of frontal platform, and mesosoma with dense, long, white setae, setal length twice midocellar diameter or more. Metapostnotum



Plates 5–6. *Dolichurus arabicus* nov. spec., female paratype, al-Ajban, UAE. 5: Lateral view; 6: Metasoma in dorsal view.



Plates 7–8. *Dolichurus arabicus* nov. spec., male paratype, Oman. 7: Lateral view; 8: Dorsal view.



Plates 9–10. *Dolichurus arabicus* nov. spec., male paratype, Oman. 9: Head from below; 10: Metasoma in dorsal view.

almost asetose, shiny. Metasoma covered with short, white setae, setal length markedly less than one midocellar diameter. Mandible broad, robust, with one large tooth on inner margin. Clypeus shallowly punctate, but sculpture largely obscured by dense white vestiture; with median carina, apically terminating in small, blunt tubercle. Median clypeal lobe broadly, deeply emarginate, emargination laterally terminating in blunt tubercle. Frontal platform as broad as long, irregularly, shallowly sculptured throughout; anterior and lateral margin markedly bulging and shiny. Scape with longitudinal, somewhat rounded carina ventrally. Length of flagellomeres I–III subequal, following flagellomeres becoming progressively shorter. Frons from base of frontal platform to level of midocellus irregularly rugose, rugulae more or less oriented to midocellus. Vertex irregularly punctate behind lateral ocelli, punctures not more than 1.0 diameters apart, punctures shallow posterad. Pronotal collar transversely carinate anteriorly, irregularly, shallowly punctured posteromedially. Pronotal tubercle sparsely, shallowly punctured, shiny. Pronotal sides coarsely, longitudinally carinate toward anterior and posterior margin, shiny medially. Scutum and scutellum coarsely punctured, punctures not more than one diameter apart, interspaces shiny. Omaular sulcus, acetabular sulcus, sternaulus, and scrobal sulcus coarsely pitted, complete. Omaular and acetabular sulcus accompanied by a carina anteriorly. Metanotum irregularly rugose. Metapleuron longitudinally carinate in lower part, with a few coarse carinae in upper part. Metapostnotum with five longitudinal carinae, posteriorly delimited by a lamellate carina. Propodeal sides with irregular, lamellate carina dorsally. Propodeal hindface irregularly, coarsely rugose; laterally delimited by irregular carina, which terminates posteriorly in a tooth-like projection. Punctures on tergum I coarse, somewhat irregular, 1–2 diameters apart, generally denser so on tergum II. Tergum III evenly, densely punctate, less than one diameter apart. Sternum III with a strong, transverse carina subapically, sternal area behind carina markedly depressed, finely sculptured, without coarse punctures.

Body length 3.6–5.3 mm; forewing length 2.4–3.5 mm; length-width ratio of flagellomere I 2.6–2.8; ratio of lower to upper interocular width 0.9–1.0; ratio of distance between lateral ocellus to eye margin to midocellar diameter 1.6–1.8.

Distribution: *Dolichurus arabicus* nov. spec. is known from the UAE and Oman.

Derivation of name: The new species is named after its Arabian distribution. It is an adjective in the masculine gender.

***Trirogma caerulea* Westwood, 1841**

(Figs 11–12)

Trirogma caerulea Westwood, 1841: 152, ♂. Holotype or syntypes: ♂, northern India: no specific locality (depository?).

Specimen examined: Sharjah, 22–23.iv.2006, 1♂, light trap, leg. C. Gielis.

Diagnosis: Among all apoid wasps, *T. caerulea* has a unique character combination of a single complete, deeply grooved antennal platform and a metallic-blue overall colouration. The two Arabian species of *Ampulex* have also metallic colour, but each antennal base is covered by a separate overhanging lobe. *Dolichurus arabicus* has also a complete antennal platform, but it is not deeply grooved and the overall colour is black.

Comments: *Trirogma* was included in the key to Arabian sphecid genera by Guichard (1986), although no record of this genus from Arabia has been published yet. *Trirogma* currently includes seven described species from Iraq to Borneo, but *T. caerulea* is regarded as the most widely distributed species. However, *Trirogma* is in need of a taxonomic revision, and *T. caerulea* might in fact be a composite of two or more species.



Plates 11–12. *Tirogma caerulea* Westwood, Sharjah, UAE, male. 11: Lateral view; 12: Dorsal view.

The single specimen from the UAE has been collected in a dry light trap with chloroform as killing agent in the garden of a town house. This is unusual as *T. caerulea* does not show any morphological indication of a nocturnal mode of life (e.g. pale colouration). It cannot be excluded that the specimen was flying early on the day and has been collected incidentally in the light trap.

Distribution: Widespread in the Oriental region, as far west as Iraq (Abdul Rassoul, 1976) and Iran (Ebrahimi, 2008).

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I thank Wojciech J. Pulawski (CAS) for the information on the two males of *Ampulex assimilis* in the collection of the California Academy of Sciences, which were originally in the personal collection of the late C.G. Roche. He also informed me about Michael Prentice' use of the term 'first intersubmarginal cell'. The multifocus photographs have been prepared by Juliette Brauer, Berlin. I am particularly indebted to Toni van Harten for constantly providing me with UAE specimens over the years. Financial support by the German Science Foundation (DFG) for a collecting trip to Oman is acknowledged (OH 81/4).

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Author's address:

Dr. Michael Ohl, Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung an der Humboldt-Universität zu Berlin, Invalidenstr. 43, D-10115 Berlin, Germany; e-mail: michael.ohl@mfn-berlin.de

Order Hymenoptera, families Crabronidae and Sphecidae

Christian Schmid-Egger

INTRODUCTION

Sphecid wasps or digger wasps are large (30 mm) to minute (1.8 mm) wasps with a worldwide distribution and a focus in arid and semi arid areas. Females hunt other insects or spiders for larval nutrition, a few species develop as cleptoparasitoids of other sphecids. Around 300 of the 7000 worldwide species occur in the Arabian Peninsula (Ohl, in litt., own observation). Part of the genera of the Arabian fauna were revised by Guichard (1980–1994), other genera were dealt with in several revisions by Pulawski (1962–1995) and other authors. Consequently, knowledge about the sphecids from Arabia is quite extensive. Nevertheless, some important genera that occur in the Arabian Peninsula and southwest Asia have not been revised until now and therefore identification of a part of the collected species will remain doubtful or is impossible for the moment.

Sphecid wasps are mainly active during daylight and prefer high temperatures. They can be captured by hand-netting or by various kinds of traps. In desert areas, water traps are successful for sphecid collecting as well as Malaise traps. Collecting of the quick flying species of some genera, e.g. *Bembix*, *Stizus* or large *Spheex*-related species, is not easy and needs some experience and luck. Specimens can mainly be found on various flowers, but also on nesting places. Most Arabian species nests in the ground. Wood nesting species are rare because of lack of trees and larger shrubs in the deserts. The examined species occur in all important habitats of the UAE, from the costal dunes to the desert places (mainly in small oases or farms), as well as in the mountains.

The most important collecting methods in the present investigation have been various kinds of traps. Because of this, the results differ from those of earlier examinations of sphecids in Arabia, and there is a marked increase of species with small body size (less than 5.0 mm) such as *Solierella*, *Miscophus*, *Eremiasphecium*, *Belomicrus*-related species and others. These genera are mostly overlooked by traditional sampling methods with a net, caused by the inconspicuous behaviour of these minute species.

The former Hymenoptera family Sphecidae (s. lat., here called 'sphecids') is now divided into four families, forming the superfamily Apoidea together with the bees (Apidae). The present contribution covers most of the Crabronidae and Sphecidae s. str. The genera *Trypoxylon* Latreille, 1796, *Pseudomicroides* Antropov, 2001, and *Belomicroides* Kohl, 1899, will later be dealt with by Antropov, the genus *Tachyspheex* by Straka & Schmid-Egger, and the genus *Nitela* Latreille, 1809, by Gayubo & Schmid-Egger. The genera *Diodontus* Curtis, 1834, *Larra* Fabricius, 1793, *Pseudoscolia* Radoszkowski, 1876, the subfamily Astatinae and some other single specimens could not yet be identified and will possibly be published later. The two remaining small families of sphecids consist of the Heterogynaeidae (1 species in the UAE; dealt with by Ohl, 2008), and the Ampulicidae (2 species in the UAE; M. Ohl, in this volume).

For the present contribution, 2665 specimens were examined, belonging to 128 species; 41 additional species are included from literature citations, consequently 169 species belonging to the fauna of the UAE are dealt with in the present paper. Eight species are described as new to science: *Bembix hauseri* (also occurring in Oman), *Crossocerus antropovi*, *Eremiasphecium pulawskii*; *Laphyragopus strakai*, *Miscophus paolorosai*, *Plenoculus vanharteni*, *Solierella jacobsi*, and *Synnevrus ohli*; 82 species are new for the

fauna of the UAE, and 34 species are new to the Arabian Peninsula. About 35–40 additional species can be expected from the material not yet identified, which gives an expected total number of about 210 species of ‘sphecids’ in the UAE.

MATERIALS AND METHODS

This chapter is based on material collected in the framework of the UAE Insect Project, Sharjah, by Antonius van Harten between 2005 and 2009; by Martin Hauser in March 2008, and by the author in March 2009; also on material collected by E. Sugden in 1984. Some other records of specimens collected by Oistein Berg, Oslo/Norway, Erwin Scheuchl, /Germany and Jan Batelka, Prague/Czech Republic have been added and a few additional specimens from the UAE were found in the Oberösterreichisches Landesmuseum, Linz/Austria. Antonius van Harten and E. Sugden collected their material in traps (water traps, light traps, Malaise traps) only, the material of Martin Hauser, Jan Batelka and the author was collected by hand netting. The author visited the country for a second time in January 2011, but includes here only paratype data of two new species. The remaining material will be published later.

The present checklist includes examined material as well as species mentioned in literature. The following information is given below: ‘specimens examined’: number of examined specimens, locations, and flight period. Only in types or in very rare specimens (up to 2 or 3 records), detailed information is given. The collector of most specimens is Antonius van Harten, he is not always mentioned separately. Longitude and latitude information is only given for type specimens, a full list of location data is given in the ‘Introduction’ to this volume.

The material is mainly deposited in following collections: Author’s collection (CSE), collection of Humboldt Museum, Berlin/Germany (Berlin), UAE Invertebrate Collection and the collection of Naturalis, Leiden/Netherlands. Types are deposited in Berlin, until otherwise stated. Specimens collected in the localities Dubai/al-Awir and Dubai/Nakhalai were collected by E. Sugden only, and are deposited in the California Department of Food & Agriculture, Sacramento, California/USA.

The systematic account follows that of Pulawski (internet database, 2010) with a few exceptions only. Genera and species are listed alphabetically within both families Sphecidae and Crabronidae. Literature citations for species identification are given, or identification keys and short diagnosis are included when necessary. Morphological terms follow that of Bohart & Menke (1976), and Pulawski & Prentice (2008). Antenna is divided into scape, pedicel and flagellomeres. Males have 11 flagellomeres (10 in some *Solierella*), females have 10 flagellomeres. In each plate, body length (= L) of the specimen is given.

Abbreviations used: AvH = A. van Harten; CSE = C. Schmid-Egger, ES = E. Sugden, MH = M. Hauser; NARC = National Avian Research Centre; OOL = ocellar ocular line; POL = posterior ocellar line.

SYSTEMATIC ACCOUNT

Family Crabronidae

Genus *Ammatomus* A. Costa, 1859

Identification: Pulawski, 1973.

Key to the species of *Ammatomus* from the Arabian Peninsula

- 1 Lateral carina of tergum I reaches end of tergum I. Hind tarsi yellow. In Arabia only in Oman: (Guichard, 1980) *Ammatomus asiaticus* Radoszkowski
- Lateral carina of tergum I end in apical half or 2/3 of tergum I. At least hind tarsus V partly black, in some *mesostenus* completely yellow 2
- 2 Hind tarsal segments I–III apically with black spot, hind tarsus V black. Diameter of mesonotal punctures large, similar to punctures of mesopleuron *Ammatomus rufonodis* Radoszkowski
- Hind tarsal segments I–III yellow, hind tarsus V in most specimens black in apical half. Mesonotal punctures very small, half as large as mesopleural punctures *Ammatomus mesostenus* Handlirsch

Ammatomus mesostenus Handlirsch, 1888

Plates 1–2

Specimens examined: 42 specimens. Al-Ajban. Flight period: March–November.

Discussion: The specimens from the UAE differ from other specimens by colour. Tergum I and hindfemora are red, except for yellow tergal spots, and these parts are black in specimens from Egypt and Yemen. Mesonotal punctures much smaller and more scattered in specimens from the UAE (punctures 1–3 diameters apart), whereas punctures are large and punctuation is denser in specimens from other origins. It cannot be excluded that the specimens from the UAE represent a separate species, but more material from other Arabian countries is needed to make a final decision.

Distribution: North Africa, Yemen, Iran to Central Asia (Pulawski, 1973). Yemen: Al-Kadan, 17.ii.1998 (leg. A. van Harten, coll. Leiden). New to the UAE.

Ammatomus rufonodis Radoszkowski, 1877

Plate 3

Specimens examined: Wadi Madaq, 1♀, 19.iii.2009, leg. CSE.

Discussion: The species agrees with the subspec. *saharae* Handlirsch, 1895, as described by Pulawski (1973). Hind femora and basal 2/3 of tergum I are light reddish. The species is highly variable in colour, and *saharae* in my opinion has to be treated as a forma and not as a subspecies.

Distribution: North Africa, Iran to Central Asia (Pulawski, 1973). The subspec. *saharae* was described from southern Algeria. New to the UAE.

Genus *Ammoplanus* Giraud, 1869

Identification: Bouček, 2001.

Ammoplanus rhodesianus Arnold, 1924

Plates 4–5

Specimens examined: 19 specimens. Al-Ajban, North of Ajman, Dubai/Nakhalai, ar-Rafah, Sharjah Desert Park, Um al-Quwain, Wadi Madaq, Wadi Shawkah. Flight period: October–May.

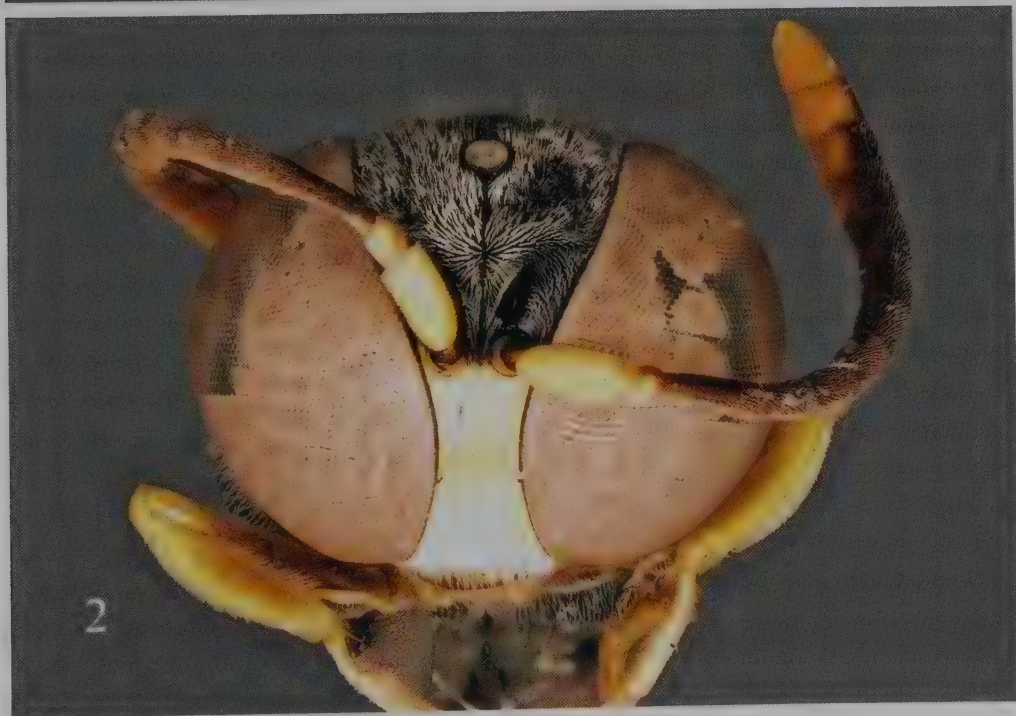
Discussion: This species belongs to the subgenus *Ammoplanellus* Gussakovskij, 1931, and is well characterized by the form of the marginal cell of the forewing, which is anteriorly open; the enclosing vein is clearly not reaching the anterior margin of wing. Legs are dark reddish in both sexes, in contrast to *A. simplex*, which has yellowish-white legs.

Distribution: Africa, Spain and Portugal to Central Asia, UAE (Bouček, 2001).

Ammoplanus simplex Gussakovskij, 1852

Plate 6

Specimens examined: 18 specimens. Al-Ajban, Dubai/Nakhalai, Sharjah Desert Park, Wadi Madaq, Wadi Shawkah. Flight periods: October–December, April–May.



Plates 1–2. *Ammatomus mesostenus* Handlirsch. 1: Female, dorsal view, L = 8.2 mm; 2: Male, head.



Plate 3. *Ammatomus rufonodis* Radoszkowski, female, lateral view, L = 7.5 mm.

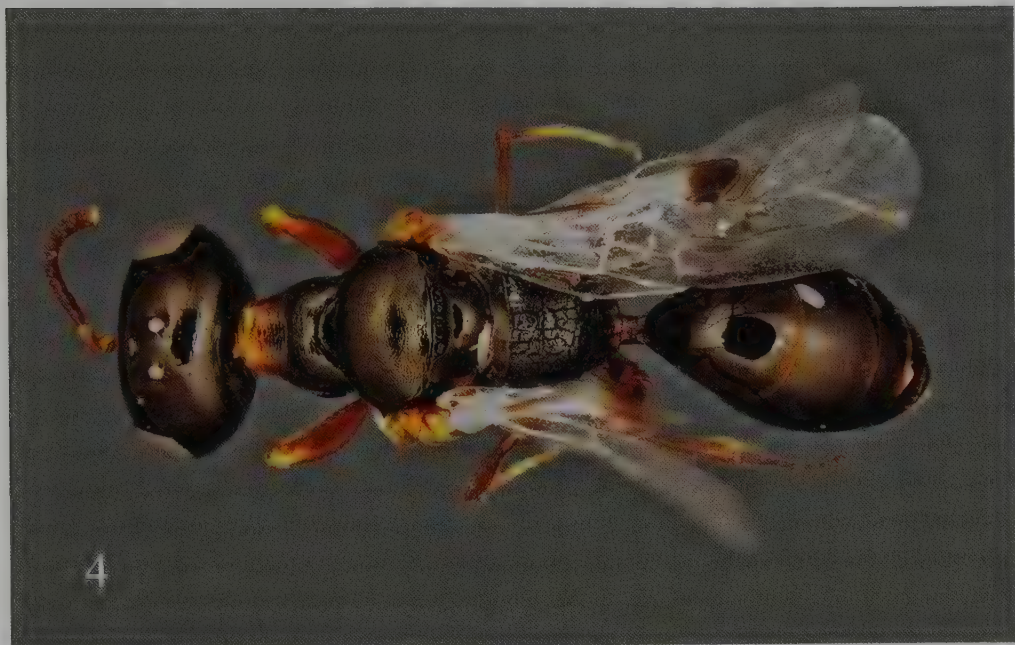
Discussion: The species belongs to the subgenus *Ammoplanellus* and is difficult to recognize with the key of Bouček (2001). Marginal cell is apically rounded. I have compared the present specimens with a female from Israel, identified by Z. Bouček. Both agree well, except some details in colour: legs, except black hindfemur, and clypeus are pale yellowish-white in the female from the UAE, whereas these parts are somewhat darker – clypeus basally black, apically reddish – in the female from Israel. *Ammoplanus simplex* can be distinguished from *rhodesianus* by yellowish-white legs, which are dark reddish in *rhodesianus*.

Distribution: Southern Europe, North Africa to India and Central Asia, UAE (Bouček, 2001).

Genus *Belomicrus* A. Costa, 1871

Discussion: The genus was revised and keyed by Guichard (1991a). Antropov (2007) described a new genus, *Guichardus*, and transferred *Belomicrus dromedarius* Guichard, 1991, to *Guichardus*. To enable the identification of the *Belomicrus* and *Guichardus* species from the Arabian Peninsula, I present a new key for those species. For more detailed studies, it is recommended to use the above mentioned literature, because further species also may occur in the UAE.

The present key is prepared for the identification of males and females of *Belomicrus* and *Guichardus* species of the Arabian Peninsula. Both genera are characterized by a mesonotal squama, similar to that of *Oxybelus*. In the latter genus, the squama is reduced to lateral parts, not connected medially, whereas the squama is connected in most *Belomicrus* (not in *Guichardus*). Also, mesonotum is markedly rugosely punctate in *Oxybelus*, and shiny with



Plates 4–5. *Ammoplanus rhodesianus* Arnold, female, L = 1.9 mm. 4: Dorsal view; 5: Lateral view.



Plate 6. *Ammoplanus simplex* Gussakovskij, female, lateral view, L = 2.0 mm.

sparse punctation in *Belomicrus* and *Guichardus*. The latter genera include minute species of 2.5 to 4.0 mm body length, whereas most *Oxybelus* are larger. The genus *Pseudomicroides* (most species originally described in *Belomicroides* Kohl, 1899) also belongs to the tribe Oxybelini and is characterized by lack of mesonotal squama. It will be treated in a separate contribution by A. Antropov.

Key to the species of *Belomicrus* and *Guichardus* from the Arabian Peninsula

- 1 Scutellum divided by a deep longitudinal furrow 2
- Scutellum flat, without furrow 3
- 2 Scape markedly emarginated below. Squama of metanotum reduced to narrow lateral spines, not connected basally, bearing long setae, directed inwards. Predominantly black species with the following parts pale: antenna, parts of legs, pronotal lobe, squama of metanotum. 2.5 mm. Female unknown *Guichardus dromedarius* Guichard (for description see further below)
- Scape evenly rounded. Squama of metanotum with large lateral triangular parts, basally largely connected, without setae. Markedly pale colored species with partly red abdomen in most specimens. 2.5–3.0 mm *Belomicrus dimorphus* Guichard
- 3 Emargination of metanotal squama triangular, shorter than remaining squama. Terga II (–IV) with triangular pale lateral spots, not connected medially. Mesonotum without pubescence *Belomicrus bimaculatus* Guichard



Plate 7. *Belomicrus bimaculatus* Guichard, female, laterodorsal view, L = 3.0 mm

- Emargination of metanomal squama rectangular, longer than remaining squama medially. Terga I–V with continuous pale basal bands, remaining terga in females reddish. Specimens from Saudi Arabia may be darker *Belomicrus schulthessi* Kohl

***Belomicrus bimaculatus* Guichard, 1991**

Plate 7

Specimens examined: 96 specimens. Al-Ajban. Flight period: May, July.

Distribution: Oman, Egypt-Sinai (Guichard, 1991a). New to the UAE.

***Belomicrus dimorphus* Guichard, 1991**

Plate 8

Specimens examined: 11 specimens. Al-Ajban; Dubai/Nakhalai, Sharjah Desert Park, Wadi Madaq. Flight period: October, December, April.

Discussion: The identification was confirmed by A. Antropov.

Distribution: Arabia (Guichard, 1991a), Algeria (Leclerc, 1993). New to the UAE.

***Belomicrus schulthessi* Kohl, 1923**

Plate 9

Specimens examined: Um al-Quwain, 1♂, 4♀, 19.iii.2009, leg. CSE.

Distribution: North Africa, Saudi Arabia, Central Asia (Guichard, 1991a). New to the UAE.

Genus *Bembecinus* Costa, 1859

Identification: Schmid-Egger, 2004.

***Bembecinus acanthomerus* (Morice, 1911)**

Plate 10

Specimens examined: Wadi Madaq, Um al-Quwain, 5♂, 19.iii.2009, leg. CSE.



Plates 8–9. 8: *Belomicrus dimorphus* Guichard, female, laterodorsal view, $L = 2.8$ mm; 9: *Belomicrus schulthessi* Kohl, female, laterodorsal view, $L = 2.9$ mm.

Distribution: West and North Africa, Israel to Central Asia, Oman (Schmid-Egger, 2004). New to the UAE.

Bembecinus bytinskii de Beaumont, 1954

Plate 11

Specimens examined: 72 specimens. Al-Ajban, Dubai/al-Awir, Dubai/Nakhalai, Jebel Hafit/S of al-Ain, Sharjah Desert Park, Wadi Bih (dam), Wadi Hayl. Flight period: March–April, November.

Discussion: A female from al-Ajban has a full yellow band on tergum IV (normally it is completely black) and a yellow spot below clypeus.

Distribution: Arabian Peninsula to Israel, including the UAE (Schmid-Egger, 2004).

Bembecinus decoratus Guichard, 1980

Plates 12–13

Specimens examined: Sharjah, 15 km NE of ad-Dhaid, 1♂, 1♀, 19.iii.2007, leg. J. Batelka.

Distribution: Oman, UAE (Schmid-Egger, 2004).

Genus ***Bembix*** Fabricius, 1775

Identification: Guichard, 1989b.

Bembix chopardi Berland, 1950

Distribution: North Africa, Israel, Saudi Arabia, Oman, UAE (Guichard, 1989b).

Bembix chlorotica Spinola, 1838

Distribution: Egypt, Israel, Saudi Arabia, Oman, UAE (Guichard, 1989b).

Bembix dahlbomi Handlirsch, 1893

Discussion: It is possible that Guichard (1989b) confused this species with *B. hauseri* nov. spec.

Distribution: North Africa, Arabia, UAE (Guichard, 1989b).

Bembix freygessneri Morice, 1897

Plates 14–16

Specimens examined: 79 specimens. Abu Dhabi/Wazeel oasis, Near Mahafiz, N of Ajman, Ra's al-Khaimah, Sharjah Desert Park, Um al-Quwain, Wadi al-Helo/near tunnel; 20 km SW of Ra's al-Khaimah/Al Hamra Fort Hotel. Flight period: March (most specimens), November–December.

Distribution: North Africa, Israel, Arabia, UAE, a widespread and common species (Guichard, 1989b).

Bembix gazella Guichard, 1989

Distribution: Oman (Muscat), UAE (Guichard, 1989b).

Bembix hameri Guichard, 1989

Plates 17–19

Specimens examined: Mahafiz, 4♂, 1♀, 19.iii.2009, leg. CSE.

Distribution: UAE (Guichard, 1989b).

Bembix hauseri Schmid-Egger nov. spec.

Plates 20–22, Figures 1–7

Specimens examined: United Arab Emirates: 1♂, 2♀, desert farm, 25°08'N 55°45'E, 12.iii.2008, leg. MH. 1♂, Dubai/Lahbab env., 25.xi.2006, leg. J. Batelka & H. Pinda. 1♂, Abu Dhabi, Wazeel oasis, 25.xi.2006, leg. J. Batelka. 2♂, 4♀, Mahafiz, 19.iii.2009, leg. CSE; 1♂, 3♀, 10.i. 2011, leg. CSE. 1♂, 2♀, Sharjah Desert Park, 18.iii.2008, leg. MH; 4♂, 5♀, 19.iii.2009, leg. CSE; 2♂, 30.iv. 2009, leg. AvH; 1♂, 5♀, 10.i. 2011, leg. CSE. 1♀, 70 km S of Abu Dhabi, on Liwa road, 23,90°N 54,41°E, 10.i. 2011, leg. CSE. 7♂, 4♀, lake 17 km SW of al-Ain, 24,09°N 55,63°E, 10.i. 2011, leg. CSE. 1♀, Liwa



Plates 10–11. 10: *Bembecinus acanthomerus* (Morice), male, lateral view, L = 7.5 mm; 11: *Bembecinus bytinskii* de Beaumont, female, lateral view, L = 8.5 mm.



Plates 12–13. *Bembecinus decoratus* Guichard, 12: Male, dorsal view, L = 9.0 mm; 13: Female, dorsal view, L = 9.0 mm.



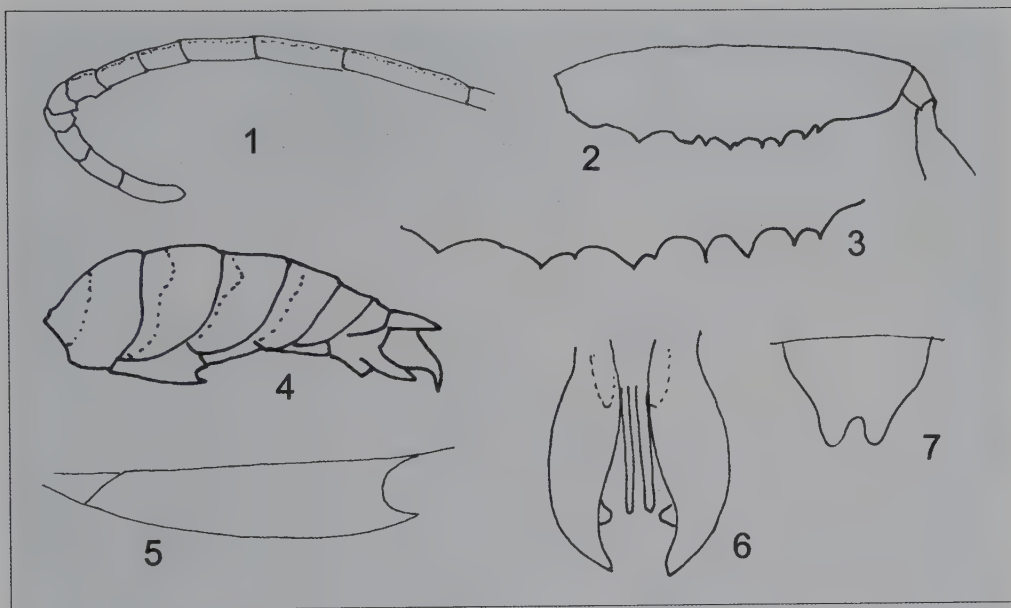
Plates 14–15. *Bembix freygessneri* Morice. 14: Male, lateral view, L = 15 mm; 15: Female, lateral view, L = 15 mm.



Plates 16–17. 16: *Bembix freygessneri* Morice, female, dorsal view, L = 15 mm; 17: *Bembix hameri* Guichard, male, dorsal view, L = 16 mm.



Plates 18–19. *Bembix hameri* Guichard. 18: Male, lateral view, L = 16 mm; 19: Female, lateral view, L = 9.0 mm.



Figures 1–7. *Bembix hauseri* Schmid-Egger nov. spec., male. 1: Antenna; 2: Fore femur; 3: Teeth on fore femur; 4: Abdomen; 5: Sternum II; 6: Genitalia; 7: Tergum VII.

desert, 10 km S of Mezairaa, 23,05°N 53,77°E, 10.i. 2011, leg. CSE. 13♀, Liwa desert, 12 km S of Arada, 22,86°N 53,39°E, 10.i. 2011, leg. CSE. 9♀, Liwa desert, 8 km S Arada, 22,92°N 53,41°E, 10.i. 2011, leg. CSE. 15♀, Liwa Oasis, 4 km SE of Sabkha, 23,10°N 54,00°E, 10.i.2011, leg. CSE. 3♂, 8♀, Liwa Oasis, 5 km E Mezairaa, 23,12°N 53,84°E, 10.i. 2011 leg. CSE. 2♂, Liwa Oasis, Al Hama'im, 22,96°N 54,28°E, 10.i. 2011 leg. CSE. OMAN: 2♂, 2♀, 'J. Huwarrah, 24.iii.2000' (leg. M. Gillett, coll. OLL, location not identifiable, probably Jebel Wahrah, 23°12'N 56°44'E). 3♀, 25.iii.1995, 250 km S of Nizwa, 100 km SE of Ghaba Hotel (leg. Wittmann, CSE). A male from Sharjah Desert Park (19.iii.2009, leg. CSE) is chosen as holotype and deposited in the Museum für Naturkunde, Berlin/Germany, the other specimens are paratypes.

Discussion: Guichard (1989b) mentions that *dahlbomi* from eastern Arabia differs in colour (more grey) and in colour pattern (mesonotum black, terga with basal bands) from African *dahlbomi*. This colour form agrees with the colour pattern of *hauseri*. I could not examine true *dahlbomi* from the Arabian Peninsula and it is possible that Guichard (1989b) did not recognize *hauseri* and described it as 'dark' *dahlbomi*.

Diagnosis: The male of *hauseri* is characterized by a row of teeth on the fore femora. Among the *Bembix* species from the Palearctic region, it shares this special character only with *dahlbomi* from North Africa and Arabia and *admirabilis* Radoszkowski, 1893, from Central Asia. *Bembix admirabilis* was not examined, but the detailed redescription by Handlirsch (1893: 802) was compared and that species can be excluded. *Bembix hauseri* can be distinguished easily from both by a black meso- and metathorax. Mesonotum and propodeum are markedly yellow in other species, mesonotum with U-shaped spot in *dahlbomi* and four longitudinal stripes in *admirabilis*.

Tergum VII is laterally and apically deeply emarginated in *hauseri*, the emargination is rounded, whereas tergum VII is laterally triangular emarginated in *dahlbomi* and the apical



Plates 20–21. *Bembix hauseri* Schmid-Egger nov. spec. 20: Male, lateral view, L = 16 mm; 21: Female lateral view, L = 16 mm.



Plate 22. *Bembix hauseri* Schmid-Egger nov. spec., male, dorsal view, L = 16 mm.

emargination is lacking. *Bembix admirabilis* also has lateral rounded emarginations of tergum VII, with inner corners and a window-like patch. In the key of Guichard (1989b), the male of *hauseri* keys out to couplet 11 (*dahlbomi*) and can be recognized with this diagnosis.

The females key out to couplet 10. They can be distinguished from the remaining species by their colour pattern. The thorax is black except for the pronotum and pronotal lobes, labrum, clypeus and underside of scape are pale yellow (clypeus with two medial spots), terga have large, continuous bands, main colour is whitish-yellow with some olive. For other characters, see description.

Description of male: Body length 18 mm. Colour: Black, light yellow are labrum, mandible (with apical third dark red), clypeus, large band on inner eye margin, reaching ocellar region, connected basally, narrow horizontal band near front ocellus, narrow band along outer eye margin, scape (with black spot apico-dorsally). Flagellomeres black above, light brownish below. Pronotum with narrow apical band, laterally together with pronotal tubercles completely yellow. Mesonotum laterally with small band near tegula. Praecostal plate transparent with median yellow spot, tegula yellow with median black spot. Costal vein of forewing yellow, remaining venation dark with some reddish parts. Terga I–VI with large, pale olive-yellow bands, sterna II–V with small, lateral spots. Legs light yellow, with femora black above and partly black below, and tibiae with apico-dorsal black spot. Frons and thorax covered with long and dense silver pilosity, longest setae as long as flagellomere I. Morphology: Antennae as in Figure 1. Fore basitarsus with 6 thick and long spatulate spines, and each with a small short spine in between. Remaining legs without particularities. Sternum

II with keel, its tip markedly overhanging (Fig. 5), sternum VI with sharp keel. Sternum VII as in Figure 7. Genitalia as in Figure 6.

Description of female: Body length 16–17 mm. Colour, colour pattern and pubescence similar to male. Tergum VI and sternum V–VI black. Morphology: Fore basitarsus with 7 spatulate spines (basal spine shorter than remaining), and some smaller spines in between. Tergum VI in basal half densely and finely punctate, in apical half with large punctures, interspaces as large as punctures, shiny. Sternum II laterally with fine and dense punctures, medially with large punctures, interspaces partly larger than punctures, medially punctureless. Interspaces shiny. Remaining sterna finely and densely punctate, shiny. Tergum I basally with long, terga II–V with very short, but dense silver pubescence. Lateral pubescence of tergum IV–V partly black.

Distribution: The species is known from the desert zone in UAE, and from some places in northern Oman. During the trip in January 2011 it was the second most collected species next to *B. freygessneri*. Especially in the Liwa desert *Bembix hauseri* was common everywhere.

Ecology: The specimens from northern UAE (Mahafiz and Sharjah Desert Park) were found in two small farms. They were flying around near small flowering shrubs. The specimens from Liwa desert were collected in the Oasis or in the desert near *Zygophyllum* shrubs.

Derivatio nominis: The species is dedicated to Martin Hauser from Sacramento/California, a friend and specialist of Diptera. He found the first specimens of *Bembix hauseri*.

***Bembix kohli* Morice, 1897**

Plates 23–25

Specimens examined: Mahafiz, Sharjah Desert Park, 3♂, 19.iii.2009, leg. CSE.

Distribution: Egypt, Iran/Baluchistan, UAE (Guichard, 1989b).

***Bembix nilotica* Priesner, 1958**

Plates 26–29

Specimens examined: Al-Ajban, 6♀, 24.iv–22.v.2006, leg. AvH. Mahafiz, 1♂, 19.iii.2009, leg. CSE.

Distribution: Egypt, Israel, Arabia, UAE (Guichard, 1989b).

***Bembix nigrispina* Guichard, 1989**

Distribution: UAE, Iran/Baluchistan (Guichard, 1989b).

***Bembix oculata* Latreille, 1805**

Plates 30–33

Specimens examined: Wadi Shawkah, 1♂, 14.iii.2008, leg. MH. Wadi al-Helo/near tunnel, Wadi Wurayah, 3♂, 1♀, 19.iii.2009, leg. CSE.

Distribution: Europe, North Africa, western Asia, UAE (Guichard, 1989b).

***Bembix priesneri* de Beaumont, 1954**

Plates 34–35

Specimens examined: Sharjah/Tawi as-Saman Oasis, 1♀, 16.iii.2007, leg. J. Batelka. Mahafiz, N of Ajman, 4♀, 19.iii.2009, leg. CSE.

Distribution: North Africa, Arabia, UAE (Guichard, 1989b).

***Bembix radoszkowskyi* Handlirsch, 1893**

Distribution: North Africa, Israel, UAE (Guichard, 1989b).

***Bembix rochei* Guichard, 1989**

Plates 36–37

Specimens examined: Jebel Hafit/S of al-Ain, 1♀, leg. M. Gillett.

Distribution: North Africa, UAE (Guichard, 1989b).



Plates 23–24. *Bembix kohli* Morice. 23: Dark male, lateral view, L = 15 mm. 24: Lighter male, lateral view, L = 15 mm.



Plates 25. *Bembix kohli* Morice, male, dorsal view, L = 15 mm.

Bembix rufiventris Priesner, 1958

Plates 38–40

Specimens examined: 55 specimens: Jebel Hafit/S of al-Ain, Wadi al-Helo/near tunnel, Wadi Hayl, Wadi Madha, Wadi Wurayah. Flight period: March.

Distribution: Egypt, Israel, Jordan, Saudi Arabia, Oman, UAE (Guichard, 1989b).

Bembix saadensis Guichard, 1989

Distribution: UAE (Guichard, 1989b).

Bembix tranquebarica Gmelin, 1790

Distribution: Baluchistan, India, UAE, Oman (Guichard, 1989b).

Genus ***Cerceris*** Latreille, 1802

Identification: Guichard, 1993; Schmidt, 2000; species from Arabia are partly included.

Cerceris alboatra Walker, 1871

Distribution: Egypt, Israel, Saudi Arabia, UAE (Guichard, 1993).

Cerceris albicincta Klug, 1845

Plate 41

Specimens examined: 21 specimens. Qurraya, Khor Fakkan, Dubai/al-Awir, Dubai/Nakhalai, Wadi Bih. Flight period April–May.

Distribution: North Africa, Israel, Arabian Peninsula including UAE; one of the commonest species in Arabia (Guichard, 1993).



Plates 26–27. *Bembix nilotica* Priesner. 26: Male, lateral view, L = 15 mm; 27: Female, lateral view, L = 15 mm.



Plates 28–29. *Bembix nilotica* Priesner. 28: Male, dorsal view, L = 15 mm; 29: Female, dorsal view, L = 15 mm.



Plates 30–31. *Bembix oculata* Latreille. 30: Male, lateral view, L = 16 mm; 31: Female, lateral view, L = 16 mm.



Plates 32–33. *Bembix oculata* Latreille. 32: Male, dorsal view, L = 16 mm; 33: Female, dorsal view, L = 16 mm.



Plates 34–35. *Bembix priesneri* de Beaumont, female, L = 14.5 mm. 24: Lateral view; 35: Dorsal view.



Plates 36–37. *Bembix rochei* Guichard, female, L = 16 mm. 36: Lateral view; 37: Dorsal view.



Plates 38–39. *Bembix rufiventris* Priesner. 38: Male, lateral view, L = 17 mm; 39: Female, lateral view, L = 17 mm.



Plate 40. *Bembix rufiventris* Priesner, female, dorsal view, L = 17 mm.

Cerceris chromatica Schletterer, 1887

Distribution: North Africa, Israel, Saudi Arabia, UAE (Guichard, 1993).

Cerceris difficilis Guichard, 1993

Distribution: UAE (Guichard, 1993).

Cerceris hathor Pulawski, 1983

(= *eugenia* Schletterer, 1887, in Guichard, 1993)

Distribution: North Africa, Israel, Saudi Arabia, UAE (Guichard, 1993).

Cerceris fitzgeraldi Empey, 1973

Plates 42–43

Specimens examined: 33 specimens. Dubai/al-Awir, Dubai/Nakhalai, al-Ajban. Flight period: April–May.

Distribution: UAE, Oman (Guichard, 1990).

Cerceris hausa Arnold, 1931

Plate 44

Specimens examined: Um al-Quwain, 1♀, 18.iii.2008, leg. MH.

Distribution: Nigeria, Saudi Arabia (Guichard, 1993). New to the UAE.

Cerceris hameri Guichard, 1993

Distribution: UAE, only known from two females (Guichard, 1993).



Plate 41. *Cerceris albicincta* Klug, male, lateral view, L = 7.5 mm.

***Cerceris nugax* Arnold, 1931**

Specimens examined: 10 km E of Ra's al-Khaimah Airport, 1♂, 17.iii.2009, leg. O. Berg.

Distribution: Nigeria, Mali, Saudi Arabia, UAE (Guichard, 1993).

***Cerceris rufocincta* Gerstäcker, 1858**

Plate 45

Specimens examined: Wadi Hayl, 1♂, 15.iii.2008, leg. MH.

Distribution: Tropical Africa, Saudi Arabia (Guichard, 1990). New to the UAE.

***Cerceris straminea* Dufour, 1854**

Plate 46

Specimens examined: Um al-Quwain, 1♀, 18.iii.2008, leg. MH. Wadi Bih, 1♂, 17.iii.2009, leg. O. Berg.

Distribution: North Africa to Baluchistan, Saudi Arabia, Oman, UAE (Guichard, 1990).

***Cerceris tricolorata* Spinola, 1838**

Plate 47

Specimens examined: Dubai/al-Awir, 1♂, v.1984, leg. ES. Wadi Wurayah, 2♂, 20.iii.2009, leg. O. Berg.

Distribution: North Africa, Israel, Saudi Arabia, UAE (Guichard, 1993).

***Cerceris vagans* Radoszkowski, 1877**

(= *turkestanica* Radoszkowski, 1893, in Guichard, 1993)

Distribution: Eastern Mediterranean, Central Asia, Iran, UAE



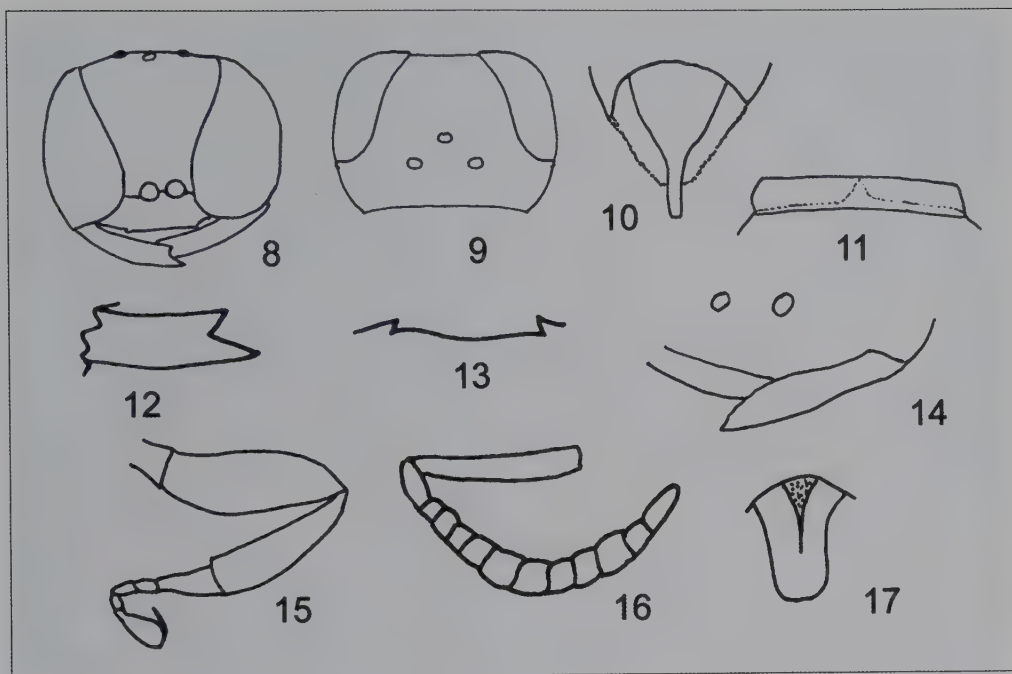
Plates 42–43. *Cerceris fitzgeraldi* Empey. 42: Male, lateral view, L = 11 mm; 44: Female, lateral view, L = 10 mm.



Plates 44–45. 44: *Cerceris hausa* Arnold, female, lateral view, L = 9.0 mm; 45: *Cerceris rufocincta* Gerstäcker, male, lateral view, L = 8.0 mm.



Plates 46–47. 46: *Cerceris straminea* Dufour, female, lateral view, L = 15 mm; 47: *Cerceris tricolorata* Spinola, male, lateral view, L = 9.0 mm.



Figures 8–17. *Crossocerus antropovi* Schmid-Egger nov. spec. 8–13: Female. 8: Head frontal; 9: Head dorsal; 10: Tergum VI, pygidium; 11: Pronotum; 12: Mandible; 13: Clypeus lower margin; 14–18: Male. 14: Mandible; 15: Foreleg; 16: Antenna; 17: Tergum VII, pygidium.

***Cerceris vagula* Kohl, 1906**

Distribution: Yemen, Saudi Arabia, Oman, UAE (Guichard, 1993).

***Cerceris vittata eurypyga* Kohl, 1898**

Distribution: North Africa, Saudi Arabia, UAE (Guichard, 1993).

Genus *Crossocerus* Lepeletier & Brullé, 1835

***Crossocerus antropovi* Schmid-Egger nov. spec.**

Plate 48, Figures 8–17

Specimens examined: ♀ (holotype), 1♂, United Arab Emirates, Jebel Hafit, 24°04'N 55°45'E, 19.iii.2009, leg. C. Schmid-Egger (coll. CSE). The male is not designated as paratype, because its identity is not absolutely clear.

Discussion: The female of *Crossocerus antropovi* nov. spec. is not identifiable with the keys to the Mediterranean species or related areas. It keys out near *Crossocerus bulawayoensis* (Arnold, 1932), *C. minutulus* (Arnold, 1944) or *C. parcorum* Leclercq, 1958 (subgenus *Coelocrabro* Thomson, 1874) with the key to the African species (Leclercq, 1958), but differs in details. All mentioned species were described from southern and central Africa and Madagascar. Therefore, I describe the present species as new to science.

The male, collected together with the female, is more problematic. In the key to the African *Crossocerus* it keys out to *bulawayoensis*, but does not agree with the description. It was also compared with the key of Leclercq (1989) to *Lindenius* Lepeletier & Brullé, 1834, because of

its unidentate mandible. The latter is a generic character of *Lindenius*. It keys out to Nr. 28 (p. 431) in a group of species that cannot be identified without females.

It differs from the female by the following characters: Mandible apically truncate (mandible bidentate in female) and pronotum dark and larger (pronotum yellow and shorter in female). Otherwise it agrees with it in general aspects like punctuation, structure of propodeum, general form of mandible and antenna, and by the short and thick setae on head. Both male and female also have a prolonged and a reddish last tergum.

I describe the male here as the male of *antropovi* nov. spec., with the restriction that most *Crossocerus* must have a bi- or tridentate mandible, but will not designate it as a paratype.

Diagnosis: The female of *antropovi* nov. spec. is characterized by a special form of pygidial plate; markedly narrowed apically with a long apical stalk (Fig. 10), and by its colour pattern (see description). Mandible is bidentate apically, propodeal dorsum is very short, finely striate and without lateral or apical limitation. Male mandible is prolonged, slightly curved and apically truncate. Fore tarsus is shorter than fore tibia, propodeal dorsum is similar to female, and colour also characteristic (see description). Tergum VII is longer than wide, bulged, reddish and with median keel. Both sexes are very small with maximum 4.0 mm body length.

Description of female: Body length 4.0 mm. Colour. Black with the following parts pale yellow: mandible except dark reddish apical margin, scape, pedicel, flagellum below (brown below), pronotum, humeral tubercle, apical half of fore femora, apex of mid- and hind femora, tibiae, tarsi (last tarsomeres brownish). Tegula transparent with two yellow basal spots. Basal sclerite of forewing yellow with small median brown spot. Wings transparent, wing venation light brown. Stalk of pygidial area reddish. Morphology. Head, mandible, clypeus and pronotum as in Figures 8–13. Space between eye and hind ocellus without impression. Head, mesonotum, scutellum and postmetanotum shiny, with very fine and scattered punctures, punctures of head 2–4 diameters apart, much denser on apical part of mesonotum. Clypeus and along inner eye margin with silver appressed pubescence. Head above covered with erect setae, somewhat shorter than midocellar diameter. Pedicel $1.5\times$ as long as wide, flagellomeres shorter than wide, last flagellomere $2\times$ as long as wide. Mesonotum apically with short longitudinal striae. Scutellum along basal margin with narrow furrow, divided by small carinae. Mesopleuron with barely visible striation and some scattered punctures in lower half, without point in lower half. Horizontal part of propodeum short, as long as pronotum, with fine longitudinal striation and some larger striae, remaining propodeum with microsculpture. Terga shiny, with very sparse and small punctures, punctures of tergum V denser than on previous terga. Pygidial area with large punctures, 1–2 diameters apart, with long stalk. Terga laterally and sterna with long erect pale setae, as long or longer than midocellar diameter. Hind femora with about 9 erect spines, as long as midocellar diameter.

Description of male: 3.5 mm. Similar to female, except for the following: Colour. Pronotum dark, fore femora yellow with small basal spot on upper side, basal sclerite with large brown median spot, Tergum VII reddish with dark base. Morphology. Mandible apically pointed, point truncate, tergum VII roof-like, with median keel, longer than wide (Fig. 17).

Distribution and habitat: The species was found at the foot of Jebel Hafit, an isolated mountain in the eastern part of the UAE desert. The habitat was a stony area with a few scattered flowering plants of various species. The *Crossocerus* specimens were found on flowering *Ochradenus aucheri* (Resedaceae).

Derivatis nominis: The species is named in honour of Alexander Antropov from Moscow, Russia, a specialist of Crabronidae.



Plates 48–49. 48: *Crossocerus antropovi* Schmid-Egger nov. spec., female, dorsolateral view, L = 4.0 mm; 49: *Crossocerus emirorum* Leclercq, female, lateral view, L = 5.0 mm.



Plate 50. *Dasyproctus arabs* Kohl, female, lateral view, L = 9.0 mm.

***Crossocerus emirorum* Leclercq, 1998**

Plate 49

Specimens examined: 19 specimens. Sharjah Desert Park, Wadi Hayl, Wadi Madaq, Wadi Shawkah, Wadi Wurayah. Flight period: October–March.

Recognition: The species is easy to recognize on account of an elongate abdominal segment I (tergum I $4\times$ as long as apical width), a shiny body surface, and colour pattern: Clypeus, scape, pronotum, pronotal lobe, scutellum and metanotum, fore and mid legs are pale yellow. Female tergum VI is triangular, shiny, with some large punctures. With this combination of characters *emiorum* is unique among *Crossocerus* species from the Palearctic region. Distribution: UAE (Leclercq, 1998, described from Wadi Bih).

Genus *Dasyproctus* Lepeletier & Brullé, 1835

Identification: Leclercq, 1990.

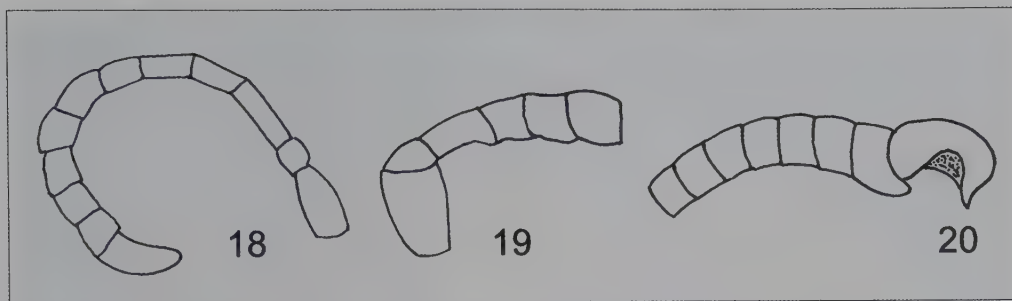
***Dasyproctus arabs* Kohl, 1894**

Plate 50

Specimens examined: 31 specimens. Jebel Hafit/S Al Ain, Sharjah Desert Park, Sharjah, 15 km NE of ad-Dhaid, Wadi Bih (dam), Wadi Hayl, Wadi al-Helo/near tunnel, Wadi Madaq, Wadi Shawkah, Wadi Wurayah. Flight period: January–March.

Distribution: Egypt/Sinai, Algeria, Pakistan, Syria, Israel, Ethiopia (Leclercq, 1990; Pulawski Database), Oman (Guichard, 1980). New to the UAE.

Genus *Didineis* Wesmael, 1852



Figures 18–20: *Didineis bucharica* Gussakovskij. 18: Female antenna; 19: Male antennal base. 20: Male antennal apex.

***Didineis bucharica* Gussakovskij, 1937**

Figures 18–20

Specimens examined: Al-Ajban, 1♀, 9.iv.2008, leg. AvH. Wadi Bih dam, 1♂, 1♀, 19.i–11.ii.2010, leg. AvH.

Discussion: The male keys out to *bucharica* in the key of Gussakovskij (1937) and agrees with the figures and description by the author. *Didineis barbieri* de Beaumont, 1968, from North Africa, and *D. latro* de Beaumont, 1967, from Turkey, can be excluded. Nevertheless, comparison with the types will be necessary for the final confirmation of the identification. The female is hitherto unknown to science. Both sexes will be described below:

Diagnosis: The male is characterized by short and thick flagellomeres, flagellomere I is emarginated below. Clypeus and inner eye margin are yellow. The emarginated flagellomere I is unique among the examined *Didineis* species. The female has also short and thick flagellomeres and shares this character with *D. crassicornis* Handlirsch, 1888, and *D. barbieri* de Beaumont 1968.

Description of male: Body length 6 mm. Colour: Black, yellow are: Basal 2/3 of mandible, clypeus, large band on inner eye margin, ending in upper 2/3, scape and flagellum below, flagellomere XI, humeral tubercle, basal spot on basal sclerite of forewing. Femora and tibiae reddish, tarsi partly reddish, mostly brown. Wing venation brown, wing surface greyish with some darker parts below pterostigma. Tergum I except base and tergum II laterally red, remaining terga black, last tergum apically somewhat reddish. Morphology: Apical clypeal margin slightly emarginate medially. Flagellum as in Figures 19 and 20. Frons, pronotum, mesonotum and upper half of mesopleuron finely punctate, 1–3 diameters apart, interspaces shiny. Punctuation of lower frons very dense. Lower mesopleuron rugulose punctate. Propodeal surface evenly striate, propodeal dorsum forming a triangular area, surrounded by fine keel. Propodeum laterally and on backside rugulose. Surface of terga II–VI divided: Basally shiny and punctureless, with fine microsculpture, apically punctate with shiny interspaces. Tergite VII densely punctate, apically truncate.

Description of female: Body length 8.0 mm. Colour. Black, yellow are basal 2/3 of mandible, clypeus except for basal and lateral margin, narrow band on lower half of inner eye margin, scape below, last tarsomeres. Red are fore tibia, outer side of midrib, terga and sterna I and II, tergum II with black apical margin, apex of tergum VI. Wings as in male. Morphology. Flagellum as in Figure 18. Punctuation of head and thorax similar to male, but in general much denser. Terga I and II shiny, without punctures, terga III–V similar as in males. Tergum VI in apical half surrounded by keel, forming a large pygidial area with dense punctuation in

apical half and with dense reddish setae. All femora below with long pale setae (2/3 as long as femoral diameter).

Distribution: Only known by the male holotype from Uzbekistan (Kashka Darya District, Guzar). New to the UAE and the Arabian Peninsula.

Genus *Dinetus* Panzer, 1806

Identification: Guichard, 1980 (key to species of *cereolus*-group, with *D. nabateus*); de Beaumont, 1960 (revision of species from the Mediterranean area).

Dinetus nabateus de Beaumont, 1960

Plates 51–52

Specimens examined: Dubai/Nakhalai, 2♀, 21.iv.1984, leg. ES. Um al-Quwain, 4♂, 19.iii.2009, leg. CSE.

Distribution: Egypt/Sinai, Oman (Guichard, 1980), Jordan (Guichard, 1991b), Israel (Schmid-Egger, unpubl.). New to the UAE.

Genus *Entomognathus* Dahlbom, 1844

Identification: Leclercq, 1997.

Entomognathus stevensoni Arnold, 1926

Plate 53

Specimens examined: N of Ajman, 1♂, 16.ix–12.x.2006, leg. AvH. Wadi Madaq, 1♂, 14–25.i.2006, leg. AvH.

Discussion: The species is easy to recognize by the 4 rounded latero–apical indentations on mesonotum (“notali”; “sillon parapsidal” in Leclercq, 1997). The notauli are lacking in the male from Ajman and are replaced by a short carina. With the key of Leclercq (1997), the species keys out to *E. nanus* (Cameron, 1890) from India and Sri Lanka. However, it does not agree with the description of *nanus*, especially the colour pattern, and fits much better the original description of *stevensoni*.

Distribution: Botswana, Burkina Faso, Gabon, Gambia, Mali, Namibia, Nigeria, Senegal, South Africa, Togo, Zaire, and Zimbabwe (Leclercq, 1997). New to the UAE and the Arabian Peninsula.

Genus *Eremiasphecium* Kohl, 1897

Identification: Marshakow, 1976 (revision of Central Asian species); Pulawski, 1992 (review of species); Simon Thomas, 1994 (description of new species).

Key to the species of *Eremiasphecium* from the Arabian Peninsula

(Venation of fore wing is difficult to examine, because veins are extremely pale and barely contrasting with the wing itself in some specimens)

- 1 Fore wing with 2 submarginal cells (Fig. 22). (Whole insect pale yellow, or parts of propodeum and some spots on terga black. Flagellomeres longer than wide. Female: Process of fore metatarsus long, half as long as fore tarsus II (Fig. 23). Male: Flagellomere VI double as long as neighbouring flagellomeres, markedly emarginated, flagellum black in apical half) *Eremiasphecium harteni* Simon Thomas
- Fore wing with 3 submarginal cells (Fig. 21) 2
- 2 Flagellomeres 1–6 shorter than wide. Female: Process of fore metatarsus short, approximately as long as diameter of fore basitarsus. (Colour variable, from wholly black to wholly pale yellow. Submarginal cell II petiolate, see Figure 21) *Eremiasphecium arabicum* Pulawski



Plates 51–52. *Dinetus nabateus* de Beaumont, male, L = 4.8 mm. 51: Lateral view; 52: Dorsal view.



Plate 53. *Entomognathus stevensoni* Arnold, male, lateral view, L = 4.0 mm.

- Flagellomeres 1–6 longer than wide. Female: Process of fore metatarsus long, approximately $1.5\text{--}2\times$ as long as diameter of fore basitarsus (cf. Fig. 23) **3**
- 3** Insect completely pale. Submarginal cell II not or very short petiolate. POL smaller than OOL. Surface of head and mesosoma shiny *Eremiasphesium schmiedeknechti* Kohl
- Insect predominantly black. Submarginal cell II markedly petiolate (cf. Fig. 21). POL larger than OOL. Surface of head and mesosoma microsculptured. Male unknown
..... *Eremiasphesium pulawskii* Schmid-Egger nov. spec.

***Eremiasphesium arabicum* Pulawski, 1992**

Plates 54–68, Figure 21

Specimens examined: Dubai/Nakhalai, 1♂, 21.iv.1984, leg. ES. Form A, 1♀, al-Ajban, vi.2006, without head, leg. AvH. Form B, 1♀, Um al-Quwain, 19.iii.2009, leg. CSE. Form C, 1♀, Wadi Shawkah, 27.xi.2006, leg. AvH. Form D, 1♀, N of Ajman, 30.vi.2008, leg. AvH. Wadi Shawkah, 2♀, March & December, leg. AvH.

Discussion: The species was only known from the female holotype, described from Saudi Arabia (El Rijadh, vi.1959). Four females from the UAE agree with the description of *arabicum* in morphology (see diagnosis), but each specimen differs markedly in colour. Two are similar in colour as described by Pulawski (1992), wholly black with mandibles, antenna, legs, tegulae pale yellow; one specimen has head and thorax black and gaster pale yellow; another specimen is wholly pale yellow without any black. Because of the similar



Plates 54–55. *Eremiasphecium arabicum* Pulawski, male, L = 2.0 mm. 54: Dorsal view; 55: Dorsal view of head.



Plates 56–57. *Eremiasphecium arabicum* Pulawski, female. 56: Forma B, dorsal view, L = 2.0 mm; 57: Forma C, dorsal view, L = 2.0 mm.



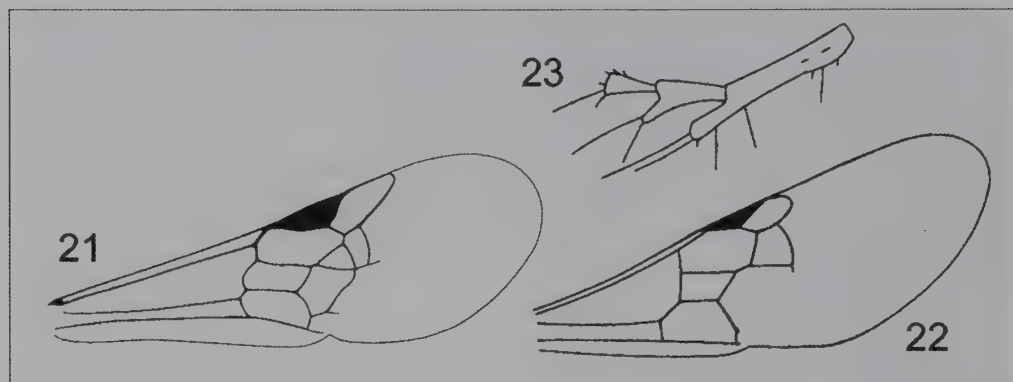
Plates 58. *Eremiasphecium arabicum* Pulawski, female, Forma D, dorsal view, L = 2.0 mm.

morphology, I treat them as conspecific. A male with similar morphology is most probably the hitherto unknown male of *arabicum*. It is wholly black, with the lower face white-yellowish.

Diagnosis: *Eremiasphecium arabicum* is characterized by a rounded head, seen in frontal view (in the other species it is wider than long), by short flagellomeres (flagellomeres I–V shorter than wide), in females by a short process of fore basitarsus and by the wing venation: 3 submarginal cells and 2 discoidal cells, submarginal cell II petiolated. For colour pattern, see description below.

Most other species of *Eremiasphecium* are completely pale yellow. Another black species is *E. budrysi* (Kazenas, 1991) from Kazakhstan, only known from the female holotype. Submarginal cells are similar to *arabicum*, but *budrysi* lacks recurrent vein II, so discoidal cell II is open. I have also examined an undescribed black species from southern Morocco with similar wing venation to *arabicum*. The female can be distinguished from *arabicum* by the form of the clypeus. Its apical clypeal margin has three teeth, lateral teeth are large and rounded, medial tooth is much smaller than lateral teeth, whereas apical clypeal margin of *arabicum* has many small irregular teeth. The male from Morocco has a black face but it is bicoloured in *arabicum*. Stigma of fore wing is pale in both sexes of the species from Morocco and dark brown in *arabicum*. Another predominantly black species is *pulawskii* nov. spec., described below.

Colour variation of *arabicum* females:



Figures 21–23. 21: *Eremiasphesium arabicum* Pulawski, female, fore wing (Figure from Pulawski, 1992); 22–23. *Eremiasphesium harteni* (Simon Thomas), female. 22: Fore wing; 23: Distal part of fore leg. (Figures 22 and 23 from Simon Thomas, 1994).

- **Forma A** (holotype from Saudi Arabia, sensu Pulawski, 1992). Black, with the following parts pale yellow: Clypeal lateral section, mandible, tegulae, humeral plate, (antenna brown dorsally), pale yellow ventrally, (scape largely dark brown), wing venation pale yellow basally, femora black and pale yellow apically, tibiae and tarsi pale yellow. A female from al-Ajban agrees with forma A, but lacks head.
- **Forma B.** Agrees with forma A, but all legs including femora are pale yellow.
- **Forma C.** Head and mesosoma are black, pale yellow are: Mandible except red tip, antenna including scape, tegulae, humeral tubercle, wing venation including pterostigma, legs including coxa and trochanter. Abdomen pale yellow with some darker marks on terga II–V baso-medially.
- **Forma D.** Whole specimen is pale ochre yellow, tip of mandible is dark red.

Description of *arabicum* male: Body length 2.0 mm. Colour. Black, pale ivory white are: Mandible (with tip reddish), lower half of face including clypeus (black colour begins above a horizontal line, crossing upper third of inner eye margin), scape, flagellum below, (dark above). tegula, humeral plate and basal parts of wing venation (pterostigma light brownish), legs (coxae and hind femora partly dark). Morphology. Body shiny, with a few scattered punctures. Propodeal dorsum uniformly microareolate. Venation of fore wing as in female (Fig. 2 in Pulawski, 1992). Flagellomeres I–V shorter than apical width, flagellomeres VI–VII as long as apical width, remaining flagellomeres longer than apical width, last flagellomere 2× as long as apical width. Fore basitarsus with 4 long spines, apical spine as long as second tarsomere.

Distribution. Saudi Arabia (Pulawski, 1992). New to the UAE.

***Eremiasphesium harteni* Simon Thomas, 1994**

Plates 59–62, Figures 22–23

Specimens examined: 29 specimens. N of Ajman, Wadi Madaq. Flight period: July–November.

Discussion: *Eremiasphesium harteni* was described by a single female from Yemen and placed into the genus *Xanthosphesium* Simon Thomas, 1994, together with *X. sahelensis* Simon Thomas, 1994, from Senegal (Simon Thomas, 1994). The author later synonymised



Plates 59–60. *Eremiasphecium harteni* (Simon Thomas), male, L = 3.0 mm. 59: Ventral view; 60: Dorsal view.



Plates 61–62. *Eremiasphecium harteni* (Simon Thomas), females, dorsal view, showing variability, L = 3.0 and 3.8 mm.



Plate 63. *Eremiasphecium pulawskii* Schmid-Egger nov. spec., female, dorsolateral view, L = 3.5 mm.

the genus with *Eremiasphecium* (Simon Thomas, 1996). His erection of *Xanthosphecium* was based on the presence of only 2 submarginal cells (3 in *Eremiasphecium*). I could not examine the type, but the specimens from the UAE agree in description with *harteni*, despite a large variability in black colour. The male of *harteni* is described here for the first time. *Eremiasphecium sahelensis* (Simon Thomas, 1994), described from 2 females only, differs from *harteni* mostly by colour characters. As it can be seen in the examined females of *harteni*, the species presents a wide variety in colour with yellow, ochre, and translucent. So both may be conspecific, but only a type comparison can confirm the conspecificity.

Diagnosis: *Eremiasphecium harteni* differs from the other species by 2 submarginal cells only (3 in remaining species of the genus), combined with a very small marginal cell. The male is additionally characterized by a long flagellomere VII, what is markedly emarginated below (similar to some males of *Ectemnius* Dahlbom, 1845). In the male of *schmiedeknechti* Kohl, 1897, flagellomere VII is also emarginated, but less deep when compared with *harteni*. The species is completely yellow with propodeum partly black. Flagellomeres VI–X are dark in most females. Colour variation and additional description of female: Body length 3.8–4.0 mm. Females are ochre yellow with some variation in colour. Dark are parts of propodeal dorsum and terga, but also some longitudinal lines on mesonotum. Colour differs markedly in examined females, from mostly pale yellow to predominantly ochre yellow or brownish.

Description of male: Body length 2.8–4.0 mm. Colour. Whitish-yellow with the following parts dark brown: Apex of mandible, head behind ocelli, flagellomeres VII–XI, narrow line on lateral edge of mesonotum, propodeal dorsum. Colour of mesosoma variable, some specimens completely pale yellow without black, but most males with propodeal dorsum

black. Base of terga II–V with narrow reddish band or pale yellow. Wing venation pale, barely visible. Pterostigma in most specimens dark brownish, but may also be pale. Morphology. Apical clypeal margin medially with 3 very small, rounded teeth. Flagellomeres I–VI somewhat longer than wide; flagellomere VII $2.5\text{--}3.0\times$ as long as wide, with deep emargination below in whole length, deeper than half diameter of flagellomere; flagellomere VIII $1.5\times$ as long as wide, flagellomeres IX–XI $2.0\times$ as long as wide. Mesosoma. Surface of body shiny, without punctures, propodeal dorsum with dense punctures ('microareolate'), propodeal sides with 7–8 diagonal striae. Last terga, tibiae and tarsi with long, silver setae. Fore tarsi with long spines (apical spines longer than next tarsal segment), without process. Distribution. Yemen (Simon Thomas, 1994). New to the UAE.

***Eremiasphecium pulawskii* Schmid-Egger nov. spec.**

Plate 63

Specimens examined: Holotype ♀, United Arab Emirates, Um al-Quwain, $25^{\circ}32'N$ $55^{\circ}32'E$, 19.iii.2009, leg. CSE (coll. CSE). Paratype ♀, 15.vi.2006, Um al-Quwain, leg. AvH (coll. CSE).

Diagnosis: *Eremiasphecium pulawskii* is a predominantly black species with 3 submarginal cells and 2 discoidal cells, and submarginal cell II petiolate (cf. Fig. 21). Therefore, it resembles the black forms of *arabicum*, but differs by a wider head, a wide emargination on apical clypeal margin, longer flagellomeres, a larger POL (POL larger than OOL in *pulawskii*, and POL smaller than OOL in *arabicum*) and by a larger process of fore basitarsus (cf. Fig. 23).

Description of female: Body length 3.5 mm. Colour. Black, whitish-yellow are: Apical third of femora, tibiae, tarsi, tegulae, humeral tubercle, wing venation (pterostigma mostly transparent), small band on scutellum apically, postmetanotum (laterally with small band only), medial band on terga I–III apically (as large as 2 ocellar diameters, not reaching tergal lateral edge). Flagellum including pedicel ochre, scape black. Mandible pale in basal half, reddish in apical half. Morphology. Head (in frontal view) $0.75\times$ as long as maximal width. Medial third of apical clypeal margin widely emarginated with small dentiform corner, remaining margin to eye straight. Antennal socket reaching clypeus. Flagellomeres I–VI slightly longer than wide, remaining flagellomeres $1.3\text{--}2.2\times$ as long as wide (becoming longer towards apex). POL slightly longer than OOL. Mesosoma. Collar short, as long as 1.5 ocellar diameters. Mesonotum basally with small median impression. Fore basitarsus with long process, reaching apical 2/3 of fore tarsus II, fore tarsus II with short process, legs with long spinulation. Wing venation as in *arabicum*, marginal cell long, apically nearly pointed. Head and mesosoma finely microsculptured, propodeal dorsum microareolate, terga shiny.

Male unknown.

Derivatis nominis: The species is dedicated to Wojciech Pulawski, a leading specialist of sphecids from San Francisco/California, USA. He supported the author's work and revised the genus *Eremiasphecium* in 1992.

***Eremiasphecium schmiedeknechti* Kohl, 1897**

Plates 64–65

Specimens examined: N of Ajman, 2♂, 2♀, vi–vii.2008, leg. AvH.

Discussion: *Eremiasphecium schmiedeknechti* is the most widespread species of the genus. I have compared the present specimens with females from Israel. Those are dark lemon coloured, whereas the females from the UAE are more or less pale yellow. The males share an emarginated flagellomere VII with *harteni*, but it is less emarginated in *schmiedeknechti*.

Distribution: Egypt, Turkmenistan, Kazakhstan, Gran Canaria, Oman (Pulawski, 1992), Israel (2 females, Arava Valley, Hazeva, $36^{\circ}28'N$ $35^{\circ}09'E$, 3.iv.1995, coll. CSE). New to the UAE.



Plates 64–65. *Eremiasphecium schmiedeknehti* Kohl. 64: Male, dorsal view, L – 3.0 mm; 65: Female, dorsal view, L = 3.1 mm.

Genus *Gastrosericus* Spinola, 1839

Identification: Pulawski, 1995.

Gastrosericus electus Nurse, 1903

Specimens examined: 6 specimens. Al-Ajban. Flight period: July–August.

Plate 66

Distribution: West Africa, Arabia to Central Asia and India, UAE (Pulawski, 1995).

Gastrosericus eremicus Pulawski, 1995

Specimens examined: Al-Ajban, 1♀, 25.vii.2006, leg. AvH.

Distribution: West Africa, Arabia to India, UAE (Pulawski, 1995).

Gastrosericus funereus Gussakovskij, 1931

Plate 67

Specimens examined: Wadi al-Helo/near tunnel, 1♂, 7.vi.2006, leg. AvH.

Distribution: North Africa, Turkey, Arabia to Central Asia and India, UAE (Pulawski, 1995).

Gastrosericus moricei E. Saunders, 1910

Plates 68–69

Specimens examined: 235 specimens. Al-Ajban, N of Ajman, Um al-Quwain. Flight period: May–August, October.

Distribution: North and west Africa, Arabia to India, UAE (Pulawski, 1995).

Gastrosericus sabulosus Pulawski, 1995

Plate 70

Specimens examined: 43 specimens. Al-Ajban. Flight period: June–October.

Distribution: West Africa, Pakistan (Pulawski, 1995). New to the UAE and the Arabian Peninsula.

Gastrosericus sanctus Pulawski, 1973

Plate 71

Specimens examined: Wadi Shawkah, 1♂, 27.xi.2006, leg. AvH.

Discussion: The females are similar to *moricei* and not distinguishable with certainty. Among a large series of *moricei* females from the coastal areas northeast of Sharjah, are some specimens with an emarginated apical clypeal margin, which may belong to *sanctus*. Because of lack of unambiguous males from these locations, I will not treat them here.

Distribution: West and south Africa, Israel, Arabia, Iran, UAE (Pulawski, 1995).

Gastrosericus waltlii Spinola, 1839

Specimens examined: 54 specimens. Al Ajban, Al-Rafa, N of Ajman, Sharjah Desert Park, Wadi Wurayah. Flight period: January–December.

Distribution: Africa, Turkey, Arabia to India and Central Asia and Mongolia, UAE (Pulawski, 1995).

Genus *Guichardus* Antropov, 2007Identification: Guichard, 1991 (see also key for *Belomicrus* above).*Guichardus dromedarius* Guichard, 1991

Plate 72

Specimens examined: Wadi Madaq, 1♂, 29.iii–10.iv.2006, leg. AvH.

Discussion: The species was described in the genus *Belomicrus* and is included in the key of Guichard (1991). It was transferred to *Guichardus* by Antropov (2007). The examined male is the second finding of the species, the female is undescribed.

Distribution: Saudi Arabia (Guichard, 1991a). New to the UAE.



Plates 66–67. 66: *Gastrosericus electus* Nurse, male, lateral view, L = 4.5 mm; 67: *Gastrosericus funereus* Gussakovskij, male, lateral view, L = 4.5 mm.



Plates 68–69. *Gastrosericus moricei* E. Saunders. 68: Male, lateral view, L = 5.5 mm; 69: Female, lateral view, L = 7.0 mm.



Pates 70–71. 70: *Gastrosericus sabulosus* Pulawski, female, lateral view, $L = 7.0$ mm;
71: *Gastrosericus sanctus* Pulawski, male, dorsolateral view, $L = 6.5$ mm.



Plate 72. *Guichardus dromedarius* Guichard, male, lateral view, L = 2.0 mm.

Genus *Harpactus* Shuckard, 1837

Identification: The genus *Harpactus* is currently under revision by Tosko Ljubomirov.

Harpactus laevis aegyptiacus Schulz, 1904

Specimens examined: Sharjah Desert Park, 1♀, 6–28.xii.2006, leg. AvH. Wadi Madaq, 1♂, 19.x–9.xi.2006, leg. AvH (det. T. Ljubomirov).

Distribution: North Africa, Israel, Senegal, Yemen (Ljubomirov, in litt). The records of “*Dienoplus* (= *Harpactus*) *formosus* Jurine, 1807” from Oman (Guichard, 1980) may also refer to this species.

Harpactus spec. aff. *quadrisignatus lugubris* de Beaumont, 1960

Specimens examined: Al-Ajban, 1♂, 17–24.iv.2006, Malaise trap, leg. AvH (det. T. Ljubomirov).

Discussion: The present specimen was examined by Ljubomirov and is probably *quadrisignatus lugubris* or a closely related undescribed species. The species can be distinguished from *laevis aegyptiacus* by the lack of red body colour, whereas the thorax is markedly red in *laevis aegyptiacus*. The records of “*Dienoplus* (= *Harpactus*) spec.” from Oman (Guichard, 1980) may also refer to this species.

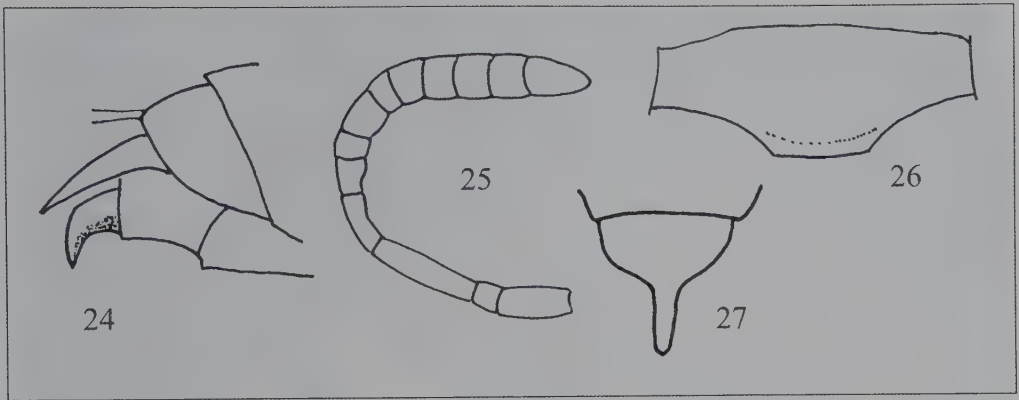
Distribution: *Harpactus q. lugubris* was described from Libya.

Genus *Hoplisoides* Gribodo, 1884

Hoplisoides ferrugineus Spinola, 1839

Specimens examined: Wadi Wurayah 1♀, 13.iii.2009, leg. CSE.

Plate 73



Figures 24–27. *Laphyragogus strakai* Schmid-Egger nov. spec., male. 24: Last abdominal terga; 25: Antenna; 26: Clypeus; 27: Tergum VII;

Distribution: Israel, Egypt, Libya, Morocco (Pulawski, internet database), Oman (Guichard, 1980). New to the UAE.

Genus *Laphyragogus* Kohl, 1889

***Laphyragogus strakai* Schmid-Egger nov. spec.**

Plate 74, Figures 24–27

Specimens examined: 2♂ (holotype and paratype), United Arab Emirates, Um al-Quwain, 25°32'N 55°32'E, 19.iii.2009, leg. CSE (coll. CSE).

Discussion: The genus *Laphyragogus* was partly revised by de Beaumont (1959). Unfortunately, the paper lacks a key and a full description of *Laphyragogus kohlii* Bingham, 1897, and the original description is not sufficient for a conclusive recognition of the species. *Laphyragogus kohlii* was recorded from northern Oman (Guichard, 1980), close to the present locality, and represents the only published record of a *Laphyragogus* in Arabia. All species described in detail by de Beaumont (1959) can be excluded for the present males, especially because of a different shape of the very special tergum VII and sternum VII. *Laphyragogus kohlii* can be excluded by colour, as *kohlii* has a marked yellow coloured head and thorax, whereas those are nearly completely black in the *strakai* male.

Diagnosis: The male of *strakai* is unique by the form of tergum VII. The apex is widely pointed, parallel-sided, apically truncate, and half as long as visible part of tergum. Apex is triangular or finely pointed in the other species. Sternum VII is markedly keeled; keel is tooth-like towards apex. Flagellomere III is weakly curved. Also, colour is characteristic: Head, flagellum and thorax are nearly completely black, whereas markedly yellow coloured in *kohli*. The female is unknown.

Description of male: Body length 7.5 mm. Colour. Black are antennae, head and thorax. Mandible pale yellow with black base and reddish-black apex. Metapostnotum, and clasp beside metapostnotum and scutellum each with narrow pale yellow band in holotype (metapostnotum black in paratype). Wings transparent, tegula, basal sclerite and wing venation whitish-yellow, apical wing venation somewhat darker. Legs pale to dark yellow, coxa, trochanter and femora black except apex. Terga and sterna dark yellowish with reddish-yellowish part (sterna and last terga darker than first terga). Head with long, dense and silver



Plates 73–74. 73: *Hoplisoides ferrugineus* Spinola, female, lateral view, L = 9.0 mm; 74: *Laphyragogus strakai* Schmid-Egger nov. spec., male, dorsal view, L = 7.5 mm.

pubescence, leaving apical half of clypeus uncovered. Setae in lower face appressed, in remaining parts erect, somewhat longer than scape. Thorax with less dense, erect long silver pubescence. Morphology. Clypeus, flagellomeres, sternum and tergum VII as in Figures 24–27. Clypeus densely punctate, medially with a few punctures only and large interspaces. Mesonotum and venter shiny, remaining surface of mesothorax (mesopleuron, propodeum) dull, microsculptured. Mesonotum and scutellum finely punctate, punctures 1–3 diameters apart. Propodeum microaereolate. Terga dull, densely punctate, no interspaces visible. Tergite VII shiny, with some large punctures. Sterna medially without setae or hairbrushes. Sternum apico-medially with two very small points. Sternum VII with tooth-like keel, keel apically as long as width of mid flagellomeres. Fore tarsomere with 9 long spines, apical spine as long as second tarsomeres. Remaining tarsomeres on fore-, mid- and hind legs also with long spines, all tarsomeres narrow.

Habitat: The males were found on sandy dunes at a beach site with scattered vegetation, by hand collecting.

Derivatis nominis: The species is dedicated to Jakub Straka, a specialist of *Crabronidae* from Prague/Czech Republic.

Laphyragogus spec.

Specimens examined: Sharjah Desert Park, 1 ♀, 1–30.xi.2008, pitfall traps, leg. AvH.

Discussion: The single recorded *Laphyragogus* female cannot be identified with the available descriptions. It may be the unknown female of *strakai* new species, as well as the female of *kohlii*. The certain association of males with conspecific females is difficult in *Laphyragogus*, because colour and morphology are markedly different in both sexes. Also, the present female was found in the desert zone of the UAE, and not together with the *strakai* male, which was found in coastal dunes. So, I hesitate to treat them as conspecific. The true identify of the present female can only be cleared up in a detailed revision of the genus and by type comparison. Nevertheless, I will describe it below to enable further identification.

Description of female: Body length 10 mm. Colour. Head lemon yellow, body pale yellow to drab. The following parts are black: Apical third of mandible, two large spots below ocelli, space between hind ocelli, band behind ocelli; mesonotum except two large oval yellow spots, small connected spot on mesopleuron and metapleuron; most of propodeal surface and propodeal backside. Flagellum dark brownish, with lighter underside. Scape, pedicel and flagellomere I yellow. Terga II–V with dark yellow basal band. Face and thorax covered with long, silvery adjacent pubescence. Morphology. Platform on sternum VI extremely large, as compared with other species. Sternum VI apically with triangular emargination.

Genus *Lindenius* Lepeletier & Brullé, 1835

Identification: Leclercq, 1989.

Lindenius aegyptius (Kohl, 1888)

Plate 75

Specimens examined: 94 specimens. Al-Ajban, N of Ajman, Wadi Safad. Flight period: February–November.

Recognition: The species is characterized by a horizontal furrow on lower mesonotum, and by marked lateral and medial teeth on apical clypeal margin.

Distribution: North Africa, Canary Islands, Pakistan and Kazakhstan (Leclercq, 1989). New to the UAE and the Arabian Peninsula.

Genus *Liris* Fabricius, 1804

Identification: de Beaumont, 1961b

***Liris agilis* Smith, 1856**

Plate 76

Specimens examined: 10 specimens. Al-Ajban, Wadi Madaq, Wadi Wurayah. Flight period: January, March, July.

Distribution: West and North Africa (de Beaumont, 1961b). Oman (Guichard, 1980). New to the UAE.

***Liris braueri* Kohl, 1884**

Plates 77–78

Specimens examined: 6 specimens. Wadi al-Helo/near tunnel, Wadi Madaq, Wadi Safad, Wadi Wurayah. Flight period: March, December.

Distribution: North Africa to Iran (de Beaumont, 1961b). Oman (Guichard, 1980). New to the UAE.

***Liris cleopatra* de Beaumont, 1961**

Plate 79

Specimens examined: 9 specimens. N of Ajman, Um al-Quwain. Flight period: March.

Distribution: Egypt, Israel, Sudan (de Beaumont, 1961b). New to the UAE and the Arabian Peninsula.

***Liris festinans praetertissimus* Richards, 1928**

Specimens examined: 15 specimens. Al-Ajban, Hatta, 10 km E of Ra's al-Khaimah Airport, Sharjah Desert Park. Flight period: March, April, August, December.

Distribution: Mediterranean area to Afghanistan (de Beaumont, 1961b). Oman (Guichard, 1980). New to the UAE.

***Liris nigricans* Walker, 1871**

Specimens examined: 9 specimens. Al-Ajban, N of Ajman, Dubai/al-Awir, Dubai/Nakhalai, Hatta, Sharjah Desert Park. Flight period: October–May.

Distribution: Widespread in Africa, Central Asia (de Beaumont, 1961b). Oman (Guichard, 1980). New to the UAE.

***Liris opalipennis* Kohl, 1898**

Plate 80–81

Specimens examined: 6 specimens. N of Ajman, Wadi Safad. Flight period: October, December.

Distribution: North Africa to Central Asia (de Beaumont, 1961b). New to the UAE and the Arabian Peninsula.

***Liris subfasciatus* Walker, 1871**

Plate 82

Specimens examined: Al-Ajban 5♂, 9♀, 7.viii.2009, leg. AvH. Sharjah Desert Park, 1♂, 1.vii.2008, leg. AvH.

Distribution: Widespread in Africa, Central Asia (de Beaumont, 1961b). Oman (Guichard, 1980). New to the UAE.

Genus *Miscophus* Jurine, 1807

Identification: The genus is currently under revision by the author.

Key to the species of *Miscophus* from the Arabian Peninsula (females only)

A key for males is not possible, because some males are difficult or impossible to distinguish from each other by the lack of good characters on clypeus and spinulation of fore legs. They can be identified together with females from the same location and agree mainly in general sculpture and colour.



Plates 75–76. 75: *Lindenius aegyptius* (Kohl), female, lateral view, L = 5.5 mm; 76: *Liris agilis* Smith, female, lateral view, L = 11 mm.



Plates 77–78. *Liris braueri* Kohl. 77: Male, lateral view, L = 13 mm; 78: Female, head in frontal view.



Plate 79. *Liris cleopatra* de Beaumont, male, lateral view, L = 8.1 mm.

- | | | |
|---|---|---|
| 1 | Anterior margin of clypeus continuous, without indentations | 2 |
| – | Anterior margin of clypeus divided into three parts | 3 |
| 2 | Mesopleuron below epimeron densely punctate, punctures large, interspaces as large as puncture diameter. Epimeron with a few, scattered punctures. Lower mesopleuron in some specimens with horizontal wrinkles | <i>Miscophus mimeticus</i> Honoré |
| – | Punctuation of mesopleuron less dense, interspaces larger than punctures. Epimeron without punctures, shiny, or with a few scattered punctures .. | <i>Miscophus affinis</i> Pulawski |
| 3 | Propodeal surface smooth and markedly shiny, at most with some barely visible transverse striae near median carina; without any pilosity. Mesonotum and frons shiny, with sparse punctation. Angle between surface and back of propodeum obtuse | <i>Miscophus paolorosai</i> Schmid-Egger nov. spec. |
| – | Propodeal surface dull with microsculpture or shiny with striation or honeycomb-like sculpture, in some species with pilosity. Mesonotum and frons in most species microsculptured or densely punctate (interspaces at most 2 diameters). Angle between surface and back of propodeum about 90–100 degrees (right angled) | 4 |
| 4 | Temples without (or with very short) pilosity. Female: Fore tarsal spines in most species less developed or absent. Males: Sternite VIII with four teeth. Smaller species, rarely longer than 6.0 mm | 5 |
| – | At least lower half of temples (behind eyes, seen in dorsal view) with erect whitish pilosity. Female: Fore tarsal spines well developed, last spine of fore metatarsus as long as or longer than second tarsal segment. Males: Sternite VIII bidentate. Larger species, mostly longer than 5.0 mm | 6 |



Plates 80–81. *Liris opalipennis* Kohl. 80: Male, lateral view, L = 8.2 mm; 81: Female, lateral view, L = 11 mm.



Plates 82. *Liris subfasciatus* Walker, male, lateral view, L = 9.5 mm.

- 5 Propodeal surface and sides markedly striate or honeycomb-like sculptured, with shiny interspaces. Scapus in most species black. Flagellomere I long, 2x as long as pedicel *Miscophus pharaonis* Andrade
- Propodeal surface and sides grain-like microsculptured or punctate, dull, without shiny interspaces and without or only with a few ridges. Scape yellow below. Flagellomere I short, 1–1.5x as long as pedicel. (Body length less than 4.0 mm) *Miscophus aenigma* Honoré
- 6 Spines of fore basitarsus long, thick, strongly spatulate apically. Apical spine of fore basitarsus at least as long as 2nd, 3rd and half of 4th tarsal segment together 7
- Spines of fore basitarsus not spatulate, but evenly pointed apically, in most specimens shorter than in *M. ctenopus* and *M. sericeus* 8
- 7 Tegula and praecostal plate yellow. Wing venation yellow. Apical dark part of forewing markedly contrasting to basal transparent part. Eye as large as half face. 5.0–6.0 mm *Miscophus sericeus* Radoszkowski
- Tegula and/or praecostal plate red, often with dark spot. Wing venation dark. Apical dark part of fore wing with greyish transition zone to basal transparent part. Eye larger than half face. 7.0–8.0 mm *Miscophus ctenopus* Kohl
- 8 Fore basitarsus with 4–5 spines (including a small basal spine) *Miscophus papyrus* Andrade
- Fore basitarsus with 3 spines *Miscophus helveticus* Kohl

Miscophus aenigma Honoré, 1944

Plate 83

Specimens examined: 24 specimens. Al-Ajban, N of Ajman. Flight period: May, September–October.

Distribution: Egypt, Israel (Schmid-Egger, in prep.). New for the UAE and the Arabian Peninsula.

***Miscophus affinis* Pulawski, 1964**

Plate 84

Specimens examined: Ar-Rafah, 1♀, 19.iii.2009, leg. CSE.

Distribution: Morocco, Egypt, Israel, Turkmenistan (Schmid-Egger, in prep.). New to the UAE and the Arabian Peninsula.

***Miscophus ctenopus* Kohl, 1885**

Plate 85

Specimens examined: 12 specimens. Bithnah, Sharjah Desert Park. Flight period: March, November–December.

Distribution: North Africa, Arabian Peninsula, Syria (Schmid-Egger, in prep.). New to the UAE.

***Miscophus helveticus* Kohl, 1883**

Plate 86

Specimens examined: Wadi Madaq, 1♀, 9.xi.2006, leg. AvH. Wadi Wurayah, 1♀, 4.xii.2006, leg. AvH.

Discussion: The specimens belong to a dark form (gaster and legs dark, with small dark red spots) with dense and long pilosity in face.

Distribution: Widely distributed in the Palearctic region (Schmid-Egger, in prep.). New to the UAE and the Arabian Peninsula.

***Miscophus mimeticus* Honoré, 1944**

Plates 87–88

Specimens examined: 68 specimens. Al-Ajban, Dubai/al-Awir, Dubai/Nakhalai, N of Ajman, Sharjah Desert Park, Wadi Siji. Flight period: April–May, August–October.

Distribution: North Africa to Central Asia, Arabian Peninsula (Schmid-Egger, in prep.). New to the UAE.

***Miscophus paolorosai* Schmid-Egger nov. spec.**

Plates 89–90

Specimens examined: ♀ (holotype), 3♂ (paratypes), United Arab Emirates, Um al-Quwain, 25°32'N 55°32'E, 11–19.iii.2009, in water traps, leg. CSE (coll. CSE). 1♂, 3♀, N of Ajman, 17.ix.2008, in water traps, leg. AvH; 1♀, 27–30.iv.2008, in water traps, leg. AvH. 2♂, 3♀, ar-Rafah, 17.iii–30.iv.2008, in water traps, leg. AvH. 3♀, lake 17 km SW of al-Ain, 24,09°N 55,63°E, 10.i. 2011, leg. CSE. 1♂, Liwa desert, 12 km S of Arada, 22,86°N 53,39°E, 10.i. 2011 leg. CSE. Holotype in Berlin, paratypes in coll. CSE.

Discussion: *Miscophus paolorosai* cannot be assigned to any of the species groups defined by Andrade (1954). The species has some similarities to *Miscophus soikai* de Beaumont, 1952, from Central Sahara and to *Miscophus bytinskii* Verhoeff, 1955, from Israel.

Diagnosis: *Miscophus paolorosai* is unique on account of a shiny and polished body surface in combination with a black body colour and partly red legs. Microsculpture is barely visible and restricted to small areas only. This shiny overall impression is uncommon for a *Miscophus* species, because most species are markedly microsculptured or, when shiny, with weak punctures and rugulation. The angle between surface and vertical part (backside) of propodeum, seen in lateral view, is obtuse with approximately 125 degrees. In most other species it is more or less right-angled.

Description of female: Body length 4.0 mm. Colour. Body 'deep' black with the following parts light reddish: Basal half of mandible, scape, pedicel, flagellomere I below, all tibiae and tarsi, hind tarsi dark reddish. Foretarsal spines black. Wing transparent, wing venation light brownish, radius dark brown. Morphology. Medial part of apical clypeal margin triangular,



Plates 83–84. 83: *Miscophus aenigma* Honoré, female, dorsal view, L = 3.5 mm; 84: *Miscophus affinis* Pulawski, female, lateral view, L = 5.0 mm.



Plates 85–86. 85: *Miscophus ctenopus* Kohl, female, lateral view, L = 7.1 mm; 86: *Miscophus helveticus* Kohl, female, lateral view, L = 7.5 mm.



Plates 87–88. *Miscophus mimeticus* Honoré, female, L = 5.5 mm. 87: Lateral view; 88: Dorsal view.



Plates 89–90. *Miscophus paolorosai* Schmid-Egger nov. spec., female, L = 4.0 mm. 89: Lateral view; 90: Dorsal view.

with obtuse angle. Lateral emargination weak. Flagellomere I as long as scape, about 3x as long as pedicel. Pronotum, mesoscutum, propodeum laterally and terga with very weak and sparse punctation. Mesopleuron with weak and barely visible microsculpture. Propodeal dorsum (surface) shiny, with medial longitudinal carina and few very weak striae near carina. Overall impression shiny and polished. For shape of propodeum see Diagnosis, propodeum markedly narrowed to apex (dorsal view). Fore basitarsus with 3 long and thin spines, apical spine reaching middle of tarsomere III. Wing venation weak, but all cells visible. Cubital cell II small.

Description of male: Body length 3.0–3.5 mm. Agrees in colour and morphology with female. Fore basitarsus with apical spine only, as long as tarsomere II. Apical clypeal margin half rounded, and flagellomere I (and II) orange reddish.

Habitat: The species was found on a beach site with sand dunes and some sparse vegetation.

Derivatis nominis: The species is dedicated to Paolo Rosa from Milan/Italy, a friend and specialist of Chrysididae (Hymenoptera).

Miscophus papyrus Andrade, 1954

Plate 91

Specimens examined: 8 specimens. Al-Ajban, Dubai/al-Awir, Um al-Quwain, Wadi Bih (dam), Wadi Madaq. Flight period: March–June.

Discussion: The species is variable in colour. Two females from the UAE differ markedly from each other: One has black femora and black flagellomeres, the other has all legs light red, flagellomeres I–II are yellow below. Nevertheless, the specimens agree in other characters with females from Egypt, the type area. Females of *papyrus* can be recognized by 4–5 forebasitarsal spines (both females from UAE have 4 spines), by a red abdomen, yellowish tegulae and an advanced medial part of apical clypeal margin. Recognition of males is not yet possible, because most males of the *helveticus* group lack valuable distinctive characters.

Distribution: North Africa, Arabian Peninsula (Schmid-Egger, in prep.). New to the UAE.

Miscophus pharaonis Andrade, 1940

Plate 92

Specimens examined: Wadi Wurayah, 1♂, 1♀, 28.i.2009, leg. AvH.

Discussion: The species is similar to *M. eatoni* Saunders, 1903, but can be distinguished by the polished and extreme shiny epimeron (upper part of mesopleuron). The epimeron is densely punctate in *eatoni*. *Miscophus pharaonis* is the only representative of the closer *eatoni* lineage from the Arabian Peninsula.

Distribution: Egypt, Israel, Oman, Yemen (Schmid-Egger, in prep.). New to the UAE.

Miscophus sericeus Radoszkowski, 1883

Plate 93

Specimens examined: N of Ajman, 3♀, 22.v.2008, 30.xi.2008, leg. AvH.

Discussion: The examined females are darker than females from Egypt, with terga II–VI and parts of femora black. Tergum I is partly or completely dark red. In females from Egypt all terga and legs are reddish.

Distribution: West and North Africa to Central Asia and Afghanistan (Schmid-Egger, in prep.). New to the UAE and the Arabian Peninsula.

Genus *Oxybelus* Latreille, 1796

Identification: Guichard, 1990. An additional key to the *Oxybelus lamellatus*-species group (species with enlarged mucron) in the Arabian Peninsula is given here:



Plates 91–92. 91: *Miscophus papyrus* Andrade, female, lateral view, L = 7.0 mm; 92: *Miscophus pharaonis* Andrade, female, lateral view, L = 4.5 mm.

Key to the Arabian species of the *Oxybelus lamellatus*-group (males and females)

- 1 Sternum II with dense punctation, punctures at most a diameter apart, in a few specimens medio-apically with some larger interspaces. Mucron in medial part with longitudinal dark spot. Metanotal squama pointed. Frons below ocelli with dense punctation *Oxybelus diphyllus* Costa
- Sternum II with large shiny interspaces, punctures 1–3 diameters apart, especially in medial half 2
- 2 Metanotal squama bifid. Frons between and below ocelli with dense punctation. Mucron medially large, brownish-reddish *Oxybelus lamellatus* Oliver
- Metanotal squama pointed. Frons between ocelli with shiny interspaces, punctures 1–2 diameters apart. Mucron in apical part transparent, with yellowish median spot *Oxybelus phyllophorus* Kohl

***Oxybelus alhumdalillieri* Guichard, 1990**

Discussions: The female is unknown.

Distribution: UAE, al-Futaisi Island (Guichard, 1990).

***Oxybelus arabicus* Guichard, 1990**

Plate 94

Specimens examined: 103 specimens. N of Ajman, Dubai/al-Awir, Dubai/Nakhalai, Jebel Hafit/S of al-Ain, Sharjah Desert Park, Wadi Bih (dam), Wadi Hayl, Wadi al-Helo/near tunnel, Wadi Madaq, Wadi Shawkah, Wadi Wurayah. Flight period: December–July.

Discussion: In addition to the information in the key, the female is also characterized by a large pale yellow spot on sternum II that may be lacking in small specimens.

Distribution: Saudi Arabia, UAE; Oman, Yemen, Jordan, Israel (Guichard, 1990).

***Oxybelus collaris* Kohl, 1884**

Distribution: Arabia, Jordan, Egypt/Sinai, UAE (Guichard, 1990).

***Oxybelus lamellatus* Oliver, 1811**

Plates 95–96

Specimens examined: 153 specimens. Al-Ajban, Dubai/al-Awir, Dubai/Nakhalai, Jebel Hafit/S of al-Ain, Mahafiz, Sharjah Desert Park, Um al-Quwain, Wadi Bih (dam), Wadi Hayl, Wadi Shawkah, Wadi Wurayah. Flight period: November–July.

Distribution: From Southwest Europe and North Africa to Northwest India, southwards to Mali, Nigeria and Niger, UAE (“one of the commonest species throughout Arabia”, Guichard, 1990).

***Oxybelus phyllophorus* Kohl, 1898**

Plates 97–98

Specimens examined: 98 specimens. Al-Ajban, Dubai/al-Awir, Dubai/Nakhalai, Mahafiz. Flight period: March–May, August, December.

Discussion: Guichard (1990) includes only *Oxybelus diphyllus* Costa, 1882, in his key, known from Oman, North Africa and Sardinia, and not the closely related *O. phyllophorus*. Both species key out to *diphyllus* in his key (Guichard, 1990). *Oxybelus phyllophorus* is common in the UAE, whereas I could not examine any *diphyllus* from the UAE. The *lamellatus*-group (species with enlarged mucron) in the Arabian Peninsula can be identified with the key given above.

Distribution: Africa (Guichard, 1990), Morocco (Schmid-Egger, unpublished). New to the UAE and the Arabian Peninsula.



Plates 93-94. 93: *Miscophus sericeus* Radoszkowski, female, lateral view, L = 6.0 mm; 94: *Oxybelus arabicus* Guichard, female, lateral view, L = 7.2 mm.



Plates 95–96. *Oxybelus lamellatus* Oliver, female. 95: Lateral view, L = 7.2 mm; 96: Mesosoma in dorsal view.



Plates 97–98. *Oxybelus phyllophorus* Kohl, female, L = 6.0 mm. 97: Lateral view; 98: Mucron.

***Oxybelus tinklyi* Guichard, 1990**

Plates 99–101

Specimens examined: 38 specimens. Al-Ajban, Dubai/al-Awir, Dubai/Nakhalai, Jebel Hafit/S of al-Ain, Sharjah, Sharjah Desert Park, Wadi al-Helo/near tunnel, Wadi Madaq. Flight period: December–August.

Distribution: Israel, Saudi Arabia, Oman, North Yemen, Mali (Guichard, 1990). New to the UAE.

***Oxybelus verhoeffi* de Beaumont, 1950**

Plate 102

Specimens examined: Dubai/Nakhalai, 1♀, 15.iv.1984, leg. ES. Mahafiz, 1♀, 19.iii.2009, leg. CSE. Sharjah Desert Park, 1♀, 28.xii.2006, leg. AvH.

Distribution: North Africa, Arabia, UAE (Guichard, 1990).

Genus *Palarus* Latreille, 1802

Identification: Pulawski & Prentice, 2008; Guichard, 1988b.

***Palarus bisignatus* F. Morawitz, 1890**

(= *P. rochei* in Guichard, 1988, synonymised with *bisignatus* by Pulawski & Prentice, 2008).

Distribution: Central Asia, UAE (Pulawski & Prentice, 2008).

***Palarus comberi* Nurse, 1911**

Plate 103

Specimens examined: N. of Ajman, 6♀, 5–16.vii.2008, leg. AvH. Ar-Rafah, 2♂, 1♀, 22.v.2008, leg. AvH.

Distribution: India, Pakistan, Saudi Arabia (Pulawski & Prentice, 2008). New to the UAE.

***Palarus dongalensis* Klug, 1845**

Distribution: North Africa, Iran, Saudi Arabia, Oman, UAE (Pulawski & Prentice, 2008; Guichard, 1988b)

***Palarus fulviventris* Latreille, 1812**

(= *P. spinolae* Saussure, 1854, in Guichard, 1988b, synonymised with *fulviventris* by Pulawski & Prentice, 2008).

Distribution: North Africa, Iran, Saudi Arabia, UAE (Pulawski & Prentice, 2008; Guichard, 1988b)

***Palarus histrio* Spinola, 1838**

Specimens examined: N of Ajman, 1♂, 13.iii.2009, leg. CSE.

Discussion: The male from UAE has a black head and thorax with the following parts dark orange reddish: Lower half of clypeus and pronotal lobe, and the following parts dark yellowish: Tegulae, narrow lateral band between scutellum and tegulae, continuous narrow band on metanotum. Red on thorax is reduced when compared with males from Morocco and wings are darker. The males from Morocco have a large and extended yellow pattern on head and thorax. Guichard (1988) described a large variation in colour in specimens from Saudi Arabia.

Distribution: North Africa to Arabia and Central Asia (Pulawski & Prentice, 2008; Guichard, 1988b). New to the UAE.

***Palarus laetus* Klug, 1845**

Plates 104–105

Specimens examined: 12 specimens. Al Ajban, North of Ajman, Dubai/al-Awir, Jebel Hafit/S of al-Ain, Sharjah Desert Park, Um al-Quwain, Wadi Bih (dam). Flight period: March, June–July, September, November.



Plates 99–100. *Oxybelus tinklyi* Guichard, female, L = 3.5 mm. 99: Lateral view; 100: Dorsal view.



Plate 101. *Oxybelus tinklyi* Guichard, female. head.

Discussion: The examined males occur in two clearly separated colour forms. Forma A is markedly yellow with complete and large yellow bands on terga I–VII. Forma B (5 males from Jebel Hafit and Sharjah Desert Park) is in general smaller and has narrower bands on terga I–III, and small medial double spots on terga IV and V. Other terga are black. One male represents a transition form. It is remarkable in that such a colour variety does not exist in the 22 examined males from North Africa, which all belong to the lighter form A.

Distribution: North and West Africa, Oman, UAE (Pulawski & Prentice, 2008; Guichard, 1988b).

Genus *Parapiagetia* Kohl, 1897

Identification: Pulawski, 1977.

Parapiagetia erythropoda Cameron, 1889

Specimens examined: 60 males. Al-Ajban. Flight period: May to August.

Distribution: Whole of Africa, Pakistan and India (Pulawski, 1977). New to the UAE and the Arabian Peninsula.

Parapiagetia substriatula R. Turner, 1917

Specimens examined: Wadi Bih, 1♂, 1♀, 19.iii.2009, leg. CSE & E. Scheuchl.

Discussion: The species was described from 3 females. The male was hitherto unknown and is here described for the first time.

Diagnosis of male: The male keys out to *P. odontosoma* Kohl, 1897, in the key of Pulawski (1977). It differs by a marked pubescence on terga (without pubescence in *odontosoma* male),

Plate 106



Plates 102–103. 102: *Oxybelus verhoeffi* de Beaumont, female, lateral view, L = 6.0 mm; 103: *Palarus comberi* Nurse, female, lateral view, L = 13 mm.



Plates 104–105. *Palarus laetus* Klug. 104: Male, dorsal view, L = 7.5 mm; 105: Female, lateral view, L = 9.0 mm.



Plate 106. *Parapiagetia substriatula* R. Turner, male, lateral view, L = 5.0 mm.

by red terga VI–VII (black), by tergum VII without lateral carinae (with carinae), and by a broader lobe of clypeal margin (nearly triangular truncate).

Description of male: Body length 5.0 mm. Colour. Black. Mandible dark yellowish except dark apical third. Pale yellow are basal spot on tegulae (remaining part transparent), wing base including basal part of veins (remaining veins light brown), and apex of femora, tibiae, tarsi (tibiae reddish below). Apical half of tergum VI, tergum VII (pygidium), and sternum VII reddish. Morphology. Clypeal apical lobe broadly truncate (broader than in *P. genicularis* (F. Morawitz, 1890)). Flagellomere I as long as apical width. Mesonotum and scutellum with very fine and dense punctation, punctures 0.5–1 diameter apart. Mesopleuron medially with large, shiny area. Propodeum dorsally with some marked cross-striae. Vein M of forewing as long as cu-a (cf. Fig. 3 in Pulawski, 1970, page 613). Tergum I 1.5x as long as apical width. Terga dull, with very fine microsculpture. Tergum VII (pygidium) shiny, with fine and dense punctation, laterally without carinae. Sternum VII with large triangular lateral teeth, and a very small point in between. Body covered with a more or less dense to scattered fine silver appressed pubescence. Setae on propodeum erect, as long as fore ocellar diameter. Appressed pubescence laterally and apically on terga I–V, leaving a large rectangular area without pubescence.

Distribution: Oman, Pakistan (Pulawski, 1977; Guichard, 1980). New to the UAE.

Genus *Philanthinus* de Beaumont, 1949

Identification: Guichard, 1990.

Philanthinus integer de Beaumont, 1949

Plates 107–108

Specimens examined: Wadi Hayl, 1♂, 19.iii.2009, leg. CSE. Wadi al-Helo/near tunnel, 1♂, 19.iii.2009, leg. CSE.

Discussion: Both males differ from examined males from Morocco. Nevertheless, I treat them as conspecific with *integer*. By the colour of terga, the specimens are similar to *P. quattuordecimpunctatus* (F. Morawitz, 1888), from Turkey and Central Asia, but the latter has longer setae on frons, a different shape of anterior clypeal margin, and a marked pale wing venation (dark brown in *integer*).

Diagnosis of males from UAE: The clypeus is completely black in one male and has very small yellow lateral and basal spots in the other male (yellow in specimens from Morocco), frons with scattered punctation (with dense punctation, punctures a diameter apart), propodeal dorsum shiny (with fine areolate microsculpture), and tergal bands I and II divided into 3 spots (continuous).

Distribution: North Africa, Israel (Guichard, 1990). New to the UAE and the Arabian Peninsula.

Genus *Philanthus* Fabricius, 1790

Identification: Guichard, 1990.

Philanthus coarctatus Spinola, 1838

Plates 109–110

Specimens examined: 178 specimens. Al-Ajban, 15 km NE of ad-Dhaid, Dubai/al-Awir, Dubai/Nakhalai, Jebel Hafit/S of al-Ain, Mahafiz, Sharjah Desert Park, Sharjah, Wadi Bih (dam), Wadi Hayl, Wadi Madaq, Wadi Shawkah, Wadi Wurayah. Flight period: January–July.

Distribution: North and West Africa, West Asia, common in Arabia including the UAE (Guichard, 1994b).

Philanthus genalis Kohl, 1891

Distribution: North Africa, Jordan, UAE (Guichard, 1994b).

Philanthus minor Kohl, 1891

Specimens examined: N of Ajman, 1♀, 19.iii.2009, leg. CSE. Mahafiz, 1♀, 19.iii.2009, leg. CSE.

Distribution: North Africa, UAE (Guichard, 1994b).

Philanthus pallidus Klug, 1845

Plate 111

Specimens examined: N of Ajman, 1♂, 19.iii.2009, leg. CSE. Mahafiz, 3♀, 19.iii.2009, leg. CSE. Sharjah Desert Park, 2♂, 19.iii.2009, leg. CSE.

Distribution: North Africa, Arabia to Iran (Guichard, 1994b). New to the UAE.

Philanthus rutilus Spinola, 1838

Plate 112

Specimens examined: N of Ajman, 1♂, 21.iii.2007, leg. J. Batelka. Um al-Quwain, 3♂, 19.iii.2009, leg. CSE.

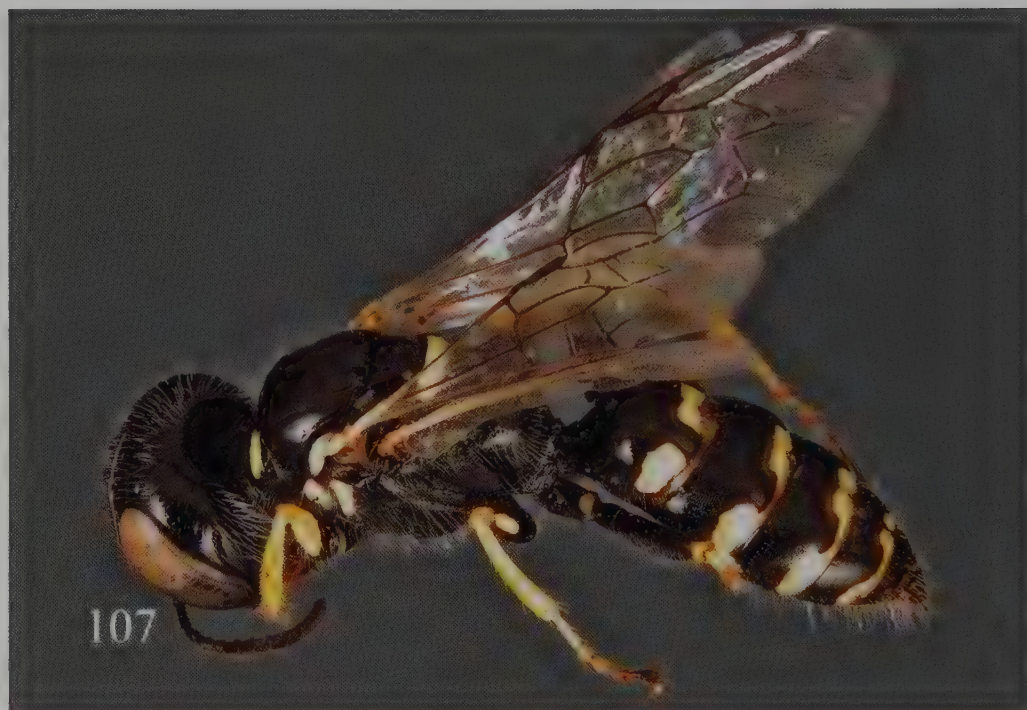
Distribution: North Africa, Yemen (Guichard, 1994b). New to the UAE.

Philanthus triangulum Fabricius, 1775

Plates 113–114

Specimens examined: 119 specimens. Al-Ajban, N of Ajman, Jebel Hafit/S of al-Ain, Mahafiz, Sharjah Desert Park, Um al-Quwain, Wadi al-Helo/near tunnel, Wadi Bih (dam), Wadi Hayl, Wadi Madaq, Wadi Shawkah, Wadi Wurayah. Flight period: March–May.

Distribution: Europe, Africa, West Asia, Arabia (Guichard, 1994b). New to the UAE.



Plates 107–108. *Philanthinus integer* de Beaumont, male, L = 6.8 mm. 107: Dorsal view; 108: Head.



Plates 109–110. *Philanthus coarctatus* Spinola. 109: Male, lateral view, L = 8.5 mm; 110: Female, lateral view, L = 9.0 mm.



Plates 111–112. 111: *Philanthus pallidus* Klug, female, lateral view, L = 10 mm: 112: *Philanthus rutilus* Spinola, male, lateral view, L = 14 mm.



Plates 113–114. *Philanthus triangulum* Fabricius. 113: Male, lateral view, L = 11 mm; 114: Female, lateral view, L = 14 mm.

***Philanthus variegatus* Spinola, 1838**

Plates 115–116

Specimens examined: 5 males. Jebel Hafit/S of al-Ain, Wadi Bih (dam), Wadi Hayl, Wadi Shawkah. Flight Period: March, June.

Distribution: North Africa, Arabia to Central Asia, UAE (Guichard, 1994b).

Genus *Pison* Jurine, 1808

Identification: De Beaumont, 1961a (does not include *Pison allonymum*. The latter keys out to *atrum* Spinola).

***Pison allonymum* W. Schulz, 1906**

Plate 117

Specimens examined: Wadi Madaq, 1♂, 25.i.2006, leg. AvH. Wadi Safad, 1♀, 2.i.2006, leg. AvH.

Discussion: The species was identified by Alexander Antropov. It may be confused with *Pison atrum* Spinola, 1808, but differs from the latter by distinctly coarser punctures on mesoscutum and propodeal dorsum, denser and more delicate punctures on abdomen (particularly on terga II–VI–VII), and by the presence of an apically widened inner basal lobe of paramere; this lobe is very narrow and apically acute in *atrum* (Antropov, in litt.). Probably the finding of *atrum* in Oman (Guichard, 1980) also refers to *allonymum*.

Distribution: South Africa, Zimbabwe, Zaire, and Ethiopia (Pulawski, internet database). New to the UAE and the Arabian Peninsula.

***Pison carinatum* Turner, 1917**

Plates 118–119

Specimens examined: Fujairah, 2♀, 22.iv–20.v.2006, light trap, leg. AvH. Wadi Safad, 8♂, 6♀, 2.i.2006, leg. AvH..

Distribution: Tropical Africa to Israel and Cyprus (Pulawski, internet database), Oman (Guichard, 1980). New to the UAE.

Genus *Plenoculus* W. Fox, 1893***Plenoculus vanharteni* Schmid-Egger nov. spec.**

Plates 120–122, Figures 28–33

Specimens examined: United Arab Emirates, 2♂, al-Ajban, 24°36'N 55°01'E, 17–24.vi.2006; 2♂, 2♀, 9.vi–2.v.2006; 1♂, 1♀, 12–19.vi.2006; in Malaise trap, leg. AvH (holotype ♂ from 17–24.iv.2006, others paratypes). 1♂, Dubai/Nakhalai, 25.iv.1984, in Malaise trap, leg. ES (paratype). Holotype deposited in Berlin, paratypes in coll. CSE.

Discussion: The genus *Plenoculus* is closely related to *Solierella* Spinola, 1851, and includes two rare species in the old World: *P. beaumonti* Andrade, 1957, from Portugal and Spain, and *P. murgabensis* Gussakovskij, 1928, from Central Asia. Other species occur in North America. I have examined a female from Turkmenistan (Repetek), that probable is *murgabensis*. It differs in some characters from the present females. The male of *murgabensis* agrees with the present species by its colour pattern, as given in the short description by Kazenas (1978), except for the lack of yellow tergal bands in *vanharteni*. The male of *P. beaumonti* has a black clypeus. So I can exclude that the new species from the UAE is identical with either *beaumonti* or *murgabensis*.

Diagnosis: *Plenoculus vanharteni* nov. spec. resembles at first glance a *Solierella* spec. It can be distinguished from *Solierella* species by the following characters: Fore tarsomeres with long apical spines in both sexes (without spines in most males), mandible with large emargination below (without emargination), Fore trochanter evenly rounded (with small basal emargination in most *Solierella* species). Male: Tergum VII with pygidial area laterally with small carinae (without lateral carinae). Female: Apical clypeal margin with large, triangular



Plates 115–116. *Philanthus variegatus* Spinola, males, in lateral view. 115: Darker specimen, L = 10 mm; 116: Lighter-coloured specimen, L = 14 mm.



Plate 117. *Pison allonymum* W. Schulz, female, lateral view, L = 8.5 mm.

Table 3. Differences between *Plenoculus vanharteni* nov. spec. and *Plenoculus murgabensis*.

Character	<i>Plenoculus vanharteni</i> female	<i>Plenoculus murgabensis</i> female (from Turkmenistan, Repetek, coll. CSE)
Body size	4.5–5.0 mm	6.0 mm
Colour of fore femora	With large, whitish spot on apex below	Completely black
Triangular clypeal emargination	Narrower than distance between inner margins of both scapes	As broad as distance between both scapes, measured from middle of scapes.
Triangular clypeal emargination	Margin as large as diameter of flagellomere I.	Margin half as large as diameter of flagellomere I.
Apical clypeal margin below outer margin of scape	Without teeth, but with rounded corner	With 3 small teeth, outer tooth larger than other.
Punctuation of mesonotum	Most interspaces larger than diameter, shiny	Interspaces smaller than diameter.
Pygidial dorsal area	Shorter than basal width; lateral parts of propodeal dorsum only with sparse pubescence	Longer than basal width; lateral parts of propodeal dorsum with marked and long pubescence.



Plates 118–119. *Pison carinatum* Turner. 118: Male, lateral view, L = 8.0 mm; 119: Female, lateral view, L = 8.5 mm.



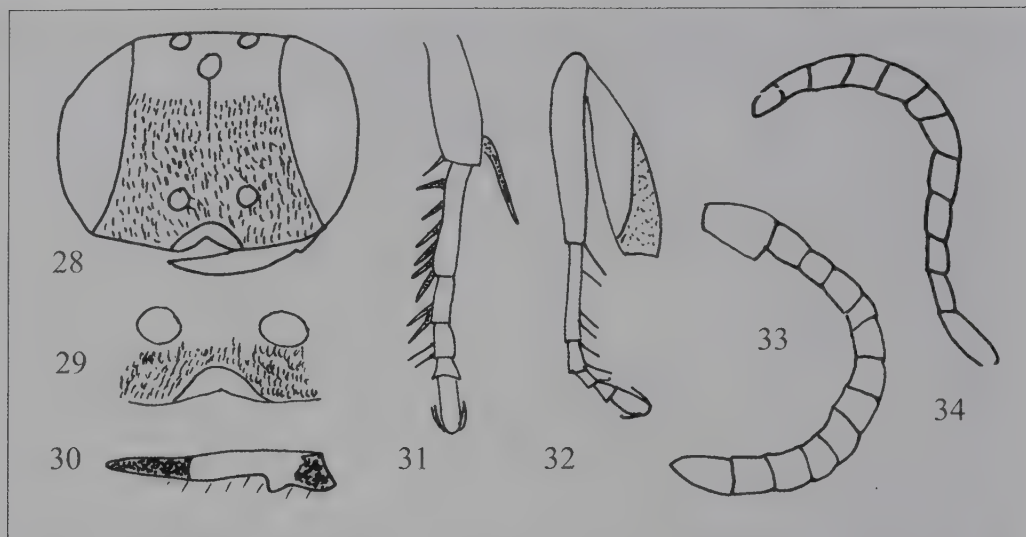
Plates 120–121. *Plenoculus vanharteni* Schmid-Egger nov. spec., male, L = 4.0 mm. 120: Lateral view; 121: Dorsal view.



Plates 122. *Plenoculus vanharteni* Schmid-Egger nov. spec., male, head in frontal view.

emargination (*Solierella* without such emargination). These characters are autapomorphies for the genus *Plenoculus* (Bitsch et al., 2007). The present male also has a completely yellow clypeus, whereas it is black in all Palaearctic *Solierella* species. Description of male: Body length 3.0–4.0 mm. Colour. Pale yellow are mandible, except for reddish apex, clypeus, scape, tibiae, tarsi, apical 2/3 of fore femur, apical 1/3 of mid- and hind femora, large spots on fore coxa, small spots on mid coxa, pronotal lobe, tegula, fore- and hind wing venation. Flagellomeres ochre yellow, with first flagellomeres dark above. Head and mesosoma covered with dense, silver appressed pubescence. Apical tergal margin pale, with band-like dense silver pubescence. Tergum VII reddish. Morphology. Antenna with 12 flagellomeres, last flagellomere 1.5x longer than flagellomere X. Head, mesosoma and terga shiny, with fine punctation, barely visible below dense pubescence. Propodeal dorsum and propodeal laterally without pubescence, propodeal dorsum finely microaereolate. Tergum VII shiny, with 5–10 large punctures, apically rounded, laterally with small carinae. Sterna shiny, with very fine and scattered punctation, apical margin paler than other parts of sterna. Fore basitarsus with 4 spines, as long as tarsal diameter, last spine somewhat longer. Legs in general with long spinulation.

Description of female. Body length 4.5–5.0 mm. Colour. Basal half of mandible yellow, except for black basal spot, flagellum brownish, darker above. Tegula transparent with basal white spot. Basal sclerite of wing and venation white, yellowish in apical part of wing. Fore femora with white large spot on apex below, tibiae and tarsi yellowish-white, tibiae dark above. Morphology. Mandible with marked tooth on basal third. Apical clypeal margin with triangular emargination. Margin of emargination shiny, large, without pubescence. Face



Figures 28–34. *Plenoculus vanharteni* Schmid-Egger nov. spec.; 28: Female head; 29: Female clypeus; 30: Female mandible; 31: Female, distal part of fore leg; 32: Male, distal part of fore leg; 33: Male antenna. 24: *Solierella jacobsi* Schmid-Egger nov. spec., male, antenna;

covered with silver pubescence, ending shortly below ocelli. Flagellomeres as long as wide, last flagellomere 1.3x as long as wide. Upper frons, mesonotum and scutellum shiny, with fine and dense punctation. Dorsal surface of propodeum with grain-like sculpture, apically with indistinct impression. Mesopleuron with dense silver pubescence. Terga I–III somewhat shiny, with very fine microsculpture. Other terga shinier, with scattered punctures. Tergum VI shiny, punctureless (except for 2–3 large basal punctures), laterally with fine edge, forming a pygidial area. Terga apically with depression that is somewhat lighter coloured than the rest of the terga. Fore basitarsus with 6 spines, as long as tarsal diameter, last spine 0.3x longer than other. Mid tibia and hind tibia with 3 rows each of 4 pale spines in apical half (all together 12–13 spines), mid basitarsus with 4 spines, hind basitarsus only with some apical spines.

Distribution: NE coast of the UAE, on sandy beach dunes.

Derivatis nominis: Named in honour of its collector, Tony van Harten, for his enormous contribution to the knowledge of Hymenoptera and other arthropods in the UAE.

Genus *Prosopigastra* A. Costa 1867

Identification: Pulawski, 1979.

Prosopigastra globiceps Morice, 1989

Plate 123

Specimens examined: N. of Ajman, 8♀, 16.vii.2008, leg. AvH.

Discussion: Colour of gaster varies in females from completely red to completely dark.

Distribution: Known from Mali, Sudan, Egypt and Israel to Central Asia and northwest China (Pulawski, 1979). New to the UAE and the Arabian Peninsula.

Prosopigastra menelaus Nurse, 1903

Plate 124

Specimens examined: N of Ajman, 5♂, 16.vii.2008, leg. AvH.



Plates 123–124. 123: *Prosopigastra globiceps* Morice, female, lateral view, L = 5.0 mm;
124: *Prosopigastra menelaus* Nurse, male, lateral view, L = 5.6 mm.

Distribution: Chad, Egypt, Central Asia to Pakistan (Pulawski, 1979), southern Israel (Schmid-Egger, unpubl.). New to the UAE and the Arabian Peninsula.

Genus *Solierella* Spinola, 1851

Identification: The genus is currently under revision by the author. It was previously unknown to the Arabian Peninsula. The male of one species has only 10 flagellomeres, which is unique among Arabian Crabronidae; usually, males have 11 flagellomeres.

Key to the species of *Solierella* from the UAE (males)

(If clypeus is yellow, compare with *Plenoculus vanharteni* Schmid-Egger nov. spec.)

- 1 Metanotum completely black (Antenna with 11 flagellomeres, last flagellomere as long as 5–6 previous flagellomeres) *Solierella nigradorsum* Pulawski
- Metanotum with yellowish band 2
- 2 Antenna with 10 flagellomeres. (Epimeron shiny) *Solierella jacobsi* Schmid-Egger nov. spec.
- Antenna with 11 flagellomeres 3
- 3 Last flagellomere shorter than previous one *Solierella insidiosa* de Beaumont
- Last flagellomere longer than previous one 4
- 4 Last flagellomere as long as previous 6–7 flagellomeres. Terga black *Solierella longicornis* Pulawski
- Last flagellomere as long as previous 2 flagellomeres. Terga red *Solierella dispar* Pulawski

Key to the species of *Solierella* from the UAE (females)

(If mandible and apical clypeal margin emarginated below, compare with *Plenoculus vanharteni* Schmid-Egger nov. spec.)

- 1 Metanotum completely black *Solierella nigradorsum* Pulawski
- Metanotum with yellowish band 2
- 2 Gaster mostly or completely red. Legs red and yellowish. Propodeal dorsum very finely sculptured, without carinae *Solierella dispar* Pulawski
- Gaster black. Legs without red colouration, partly black. Propodeum coarser sculptured 3
- 3 Epimeron (upper part of mesopleuron) shiny, with at most a few punctures in basal third. (All tibiae with full yellowish band on outer surface) *Solierella jacobsi* Schmid-Egger new species
- Epimeron fully punctate or finely microsculptured with only a small shiny area 4
- 4 Epimeron punctate, in apical half microsculptured or with a small shiny area. Fore- and mid tibiae with small yellow spot, hindtibia with yellowish band in basal half *Solierella insidiosa* de Beaumont
- Epimeron mostly punctate or with a very small microsculptured area. All tibiae with full yellowish band on outer surface *Solierella longicornis* Pulawski

Solierella dispar Pulawski, 1964

Plates 125–126

Specimens examined: 56 specimens. N of Ajman, Dubai/Nakhalai; Wadi Shawkah. Flight period: April–July.

Discussion. Females from the UAE differ in colour from specimens from North Africa and Israel. Abdomen is completely red, parts of thorax (propodeum, thorax laterally, pronotum)



Plates 125–126. *Solierella dispar* Pulawski. 125: Male, dorsal view, L = 2.8 mm; 126: Female, lateral view, L = 3.2 mm.

may be red. Colour of thorax is variable. In examined specimens from Israel and Morocco only terga I–II are red. Apart from colour, females and males can be recognized by the narrow, finely grain-like sculptured medial area of propodeum, and with fine silver pubescence on lateral parts of propodeal surface. Males have 11 flagellomeres (13 antennal segments), last flagellomere is thickened and somewhat longer than previous one.

Distribution: Egypt, Israel, Canary Island (Schmid-Egger, in prep.). New to the UAE and Arabia.

***Solierella insidiosa* de Beaumont, 1964**

Specimens examined: Wadi Madaq, 1♀, 9.xi.2006; 2♂, 22.xii.2005, leg. AvH.

Discussion. The female from Wadi Madaq has reduced yellowish bands on tibiae, when compared with specimens from the Mediterranean area.

Distribution: Canary Islands, North Africa, South Europe, West Asia. (Schmid-Egger, in prep.). New to the UAE and the Arabian Peninsula.

***Solierella jacobsi* Schmid-Egger nov. spec.**

Plates 127–128, Figure 34

Specimens examined: United Arab Emirates, 2♂, 2♀, Wadi Madaq, 26°19'N 56°08'E, 22.xii.2005–2.ii.2006, in water traps, leg. AvH. 1♂, 1♀, Wadi Wurayah, 5–30.xi.2008, in water traps, leg. AvH. 1♂, Wadi Wurayah farm, 1–8.iv.2009, in Malaise trap, leg. AvH. Female holotype in Berlin, paratypes in CSE. A male from Wadi Madaq, 22.xii.2005–2.i.2006, is the holotype.

Diagnosis: The female of *jacobsi* is characterized by the following character combination: Fore femora with a small yellowish spot, propodeal dorsum finely sculptured with some indistinct carinae only, and epimeron (upper part of mesopleuron) punctureless, shiny and polished. Especially the last character provides easy recognition of the species. In general view it is similar to the females of *longicornis* and *insidiosa* (see key above).

The male has a small yellowish spot on the fore femora and 10 flagellomeres (= 12 antennal segments) only. Therefore it is related to *S. verhoeffi* de Beaumont, 1964. and *S. pisonoides* (Saunders, 1873). It can be recognized by a finer sculptured propodeal dorsum (with marked carinae in *pisonoides*) that is limited by lateral carinae (without carinae in *verhoeffi*). The most obvious character is the shiny epimeron, as in female, that is punctate or microsculptured in most other species. The other Palearctic *Solierella* species (males) with 10 flagellomeres are all smaller, finer sculptured and have larger pale bands on the femora.

Description of female: Body length 4.5–5.0 mm. Colour, Black with the following parts pale yellow: Mandible (base black, apex dark reddish); outer margin of pronotal lobe, two spots on pronotum, metanotum, small spot on apex of fore femora (twice as large as hindocellus), a band on outside of all tibiae, tarsi (tarsi are partly brownish), small spot on tegulae and basal sclerite of fore wing. Wing venation dark brown. Face in lower half with dense, silver pubescence, in towards frons V-shaped emarginated. Morphology. Clypeus with shiny triangular area near apex, medial part of apical margin somewhat rounded. Frons, mesonotum, scutellum and lower mesopleuron very shiny, with dense and fine punctuation, that on mesopleuron more scattered than on rest. Epimeron shiny and polished, with some punctures in upper basal fourth. Propodeal dorsum surrounded by a fine keel, with fine, net-like striae, other parts of propodeum markedly and evenly horizontally striate. Terga finely and densely micropunctate, apical margin impressed, with band of fine silver pubescence. Fore leg without spines, except for a very short apical spine on each tarsomere.

Description of male: Body length 3.3 mm. Male agrees in colour and morphology with female, except for the following characters: Apical clypeal margin with narrow and short



Plates 127–128. *Solierella jacobsi* Schmid-Egger nov. spec. 127: Male, lateral view, L = 3.3 mm; 128: Female, lateral view, L = 4.8 mm.

point, antenna with 10 flagellomeres, last flagellomere apically pointed, as long as previous one (Fig. 34).

Distribution: Only known from the Hajar Mountains in northeast UAE, near to the border with Oman.

Derivatis nominis: The species is dedicated to Hans-Joachim Jacobs from Ranzin, Germany, a friend and specialist of Crabronidae.

Solierella longicornis Pulawski, 1964

Plates 129–130

Specimens examined: 5 specimens. N of Ajman, Dubai/Nakhalai, Near Qurayyah/Khor Fakkan, Wadi Shawkah, Wadi Bih. Flight period: March–May.

Distribution: Described from Egypt, unpublished records from Tunisia and Jordan (Schmid-Egger, in prep.). New to the UAE and the Arabian Peninsula.

Solierella nigradorsum Pulawski, 1964

Plates 131–132

Specimens examined: 15 males and females. N of Ajman, Dubai/al-Awir, Dubai/Nakhalai, Sharjah Desert Park, Wadi Madaq, Wadi Wurayah. Flight period: April–December.

Discussion: The male was hitherto unknown and is described here for the first time.

Diagnosis: The species is unique among African and west Asian *Solierella* by having a black metanotum and partly yellowish legs (small apical spots on femora, band on outside of tibiae, tarsi). The male agrees in general with the female (detailed description in Pulawski, 1964). Male has 11 flagellomeres, last flagellomere is approximately as long as 5–6 previous ones, and therefore resembles *S. longicornis*. Apart from black metanotum and longer flagellomere XI, the male also resembles *S. antennalis* de Beaumont, 1956, described from Libya.

Description of male: Body length 3.0 mm. Colour. Black with the following pale yellow parts: Pronotal lobe, large apical spot on fore femur, very small apical spot on mid- and hind femora, outside of all tibiae and tarsi. Apical half of mandible ochre yellow. Body covered with fine silver pubescence, densely appressed on lower face, pronotum, lateral parts of metanotum and propodeal dorsum, mesopleuron. Morphology. Antenna with 11 flagellomeres (13 antennal segments), last flagellomere approximately as long as 5–6 previous ones. Frons, mesonotum and mesopleuron with indistinct, fine and dense punctation. Propodeal dorsum small, triangular, dull, with very fine net-like carinae.

Distribution: Egypt (Pulawski, 1964). New to the UAE and the Arabian Peninsula.

Genus ***Spilomena*** Shuckard, 1838

Identification: Dollfuss, 1986; Simon Thomas (1995) described two additional species from Yemen.

Spilomena mocsaryi Kohl, 1898

Plate 133

Specimens examined: Wadi Madaq, 1♀, 25.i.2006, leg. AvH.

Discussion: The species agrees well with the description in Dollfuss (1986) and with examined females from my collection, except for the colour of the stigma. They are pale whitish-yellowish in the female from the UAE and brownish in the other females.

Distribution: Central and Southern Europe, Central Asia, Israel (Dollfuss, 1986). New to the UAE and the Arabian Peninsula.

Genus ***Stizoides*** Guérin-Ménéville, 1844

Identification: Guichard, 1989; Ohl, 1999.



Plates 129–130. *Solierella longicornis* Pulawski, male, L = 3.8 mm. 129: Lateral view; 130: Dorsal view.



Plates 131–132. *Solierella nigradorsum* Pulawski, male, L = 3.0 mm. 131: Lateral view; 132: Dorsal view.



Plate 133. *Spilomena mocsaryi* Kohl, female, lateral view, L = 2.5 mm.

Stizoides abdominalis Dahlbom, 1845

Specimens examined: Sharjah Desert Park, 1♀, 25.i.–22.ii.2004, light trap, leg. AvH.

Distribution: Egypt (Ohl, 1999). New to the UAE and the Arabian Peninsula.

Stizoides assimilis Fabricius, 1787

Distribution: From Africa north of equator to Arabia, India and Central Asia (Ohl, 1999), UAE (Guichard, 1989).

Stizoides citrinus Klug, 1845

Distribution: West Africa to northwest India (Ohl, 1999), UAE (Guichard, 1989, as *S. poecilopterus* (Handlirsch, 1892)).

Stizoides klugii F.Smith, 1856

Specimens examined: Wadi Bih, 1♂, 23.iii.2007, leg. AvH.

Distribution: Algeria to Egypt, Chad, Israel, Saudi Arabia, Yemen (Ohl, 1999). New to the UAE.

Genus ***Stizus*** Latreille, 1802

Identification: Guichard, 1989a.

Stizus arabicus Guichard, 1989

Specimens examined: Al-Ajban, 1♂, 11.ix.2006, leg. AvH. Dubai/al-Awir, 1♀, 15.iv.1984, leg. ES.

Distribution: Oman, UAE (Guichard, 1989a).

***Stizus bizonatus* Spinola, 1839**

Specimens examined: Dubai/al-Awir, 2♂, 5.v.1984, leg. ES.

Distribution: Egypt, Saudi Arabia, UAE (Guichard, 1989a).

***Stizus fuscatus* Morice, 1987**

Distribution: North Africa, Saudi Arabia, UAE (Guichard, 1989a).

***Stizus hyalipennis* Handlirsch, 1892**

Specimens examined: NARC, near Sweihan, 1♀, 11.v.2005, leg. AvH.

Distribution: North Africa, Israel, Saudi Arabia (Guichard, 1989a). New to the UAE.

***Stizus niloticus* Handlirsch, 1892**

Specimens examined: Jebel Hafit/S of al-Ain, 1♂, 24.iii.2007, leg. J. Batelka. Wadi al-Helo/near tunnel, 1♂, 19.iii.2009, leg. CSE. Wadi Wurayah, 1♂, 20.iii.2009, leg. O. Berg.

Distribution: North Africa, Iran, Saudi Arabia (Guichard, 1989a). New to the UAE.

***Stizus nadigi* Roth, in Nadig 1933**

Distribution: Known from North Africa and Mali to India, Saudi Arabia, UAE (Guichard, 1989a).

***Stizus ruficornis* Forster, 1771**

Specimens examined: Sharjah Desert Park, 1♂, 31.v.2005, leg. AvH. NARC, near Sweihan, 1♂, 11.v.2005, leg. AvH.

Distribution: Western Palaearctic region, Saudi Arabia, UAE (Guichard, 1989a).

***Stizus savignyi* Spinola, 1838**

Distribution: North Africa, Eritrea, Saudi Arabia, UAE (Guichard, 1989a).

Genus *Synnevrus* Costa, 1859

Identification: Nemkov, 2001.

Discussion: Nemkov (2001) and Bitsch & Leclercq (1993) treat *Synnevrus* as a valid genus, but Pulawski (2009, internet database) synonymizes it with *Nysson* Latreille, 1796. I follow Nemkov (2001) and consider *Synnevrus* as a valid genus. It can be recognized by the double apical margin of tergum II, whereas that is simple in *Nysson*. Also, the sculpture of thorax is markedly coarser in *Synnevrus* as in *Nysson*.

***Synnevrus barrei* Radoszkowski, 1893**

Plate 134

Specimens examined: Dubai/al-Awir, 1♀, 15–18.iv.1984; 1♂, 26–30.iv.1984; leg. ES.

Recognition: Within the genus *Synnevrus*, the female of *barrei* is unique on account of a red-coloured mesosoma. It is mostly or completely black in the other species. Edge of mesonotum is pointed laterally (dorsal view). Male mesosoma is partly red (pronotum, scutellum, parts of mesopleuron, metapleuron and propodeum laterally). Male tergum VII has long lateral teeth (somewhat longer than diameter of midocellus), without any tooth in-between. Last flagellomere is about 2x as long as basal width and simple below. Body length 5.0–6.5 mm.

The species can be distinguished from small species of *Nysson* with red body colour by the double apical margin of tergum II (generic character), by a marked occipital carina, forming a tooth on lower end, and by a coarse, honeycomb-like mesonotal punctation, which is markedly finer and with larger interspaces in most small *Nysson* species.



Plates 134–135. 134: *Synnevrus barrei* Radoszkowski, female, lateral view, L = 5.0 mm; 135: *Synnevrus ohli* Schmid-Egger nov. spec., male, dorsal view, L = 4.0 mm.

Distribution: Central Asia (Nemkov, 1991), Algeria (Pulawski, internet database). New to the UAE and the Arabian Peninsula.

***Synnevrus ohli* Schmid-Egger nov. spec.**

Plates 135–136

Specimen examined: United Arab Emirates, ♂ holotype, Dubai/al-Awir, 25°10'N 55°33'E, 22–26.iv.1984, Malaise trap, leg. ES (coll. Berlin).

Diagnosis: *Synnevrus ohli* keys out with the male of *barrei* in the key of Nemkov (2001). It is similar to *barrei* by having a laterally pointed edge of pronotum (laterally rounded in the other species), a marked occipital carina, a marked comb-like punctation on mesonotum and frons, and a lateral spine on mesoscutum. It can be distinguished from *barrei* by a shorter flagellomere XI, by a median small bulge between large lateral teeth on tergum VII (without such bulge in *barrei*), and by the lack of red colour on mesosoma (markedly red in *barrei*).

Description of male: Body length 4.0 mm. Colour. Head black, antenna reddish, with last flagellomeres dark above. Pronotum with large light yellow band, reaching pronotal lobes, the latter dark reddish. Scutellum with band in basal third. Tegulae and basal wing venation light reddish, remaining venation dark. Remaining mesosoma black. Tergum I reddish in basal half, laterally with pale yellow spots and large black space in between. Terga II and III with narrower lateral spots, remaining terga black. Tergum VI partly and tergum VII reddish. Sterna black with some reddish parts, sternum VII reddish. Legs including coxa reddish, all tibiae on outer side with narrow light yellow band over whole length. Head and mesosoma covered with silvery pilosity, densely appressed on lower face, on lower mesopleuron and laterally on pronotum. Morphology. Genae with marked edge below. Frons, mesonotum and mesoscutum with marked, comb-like punctation, punctures touching each other, deeply impressed. Punctures on mesonotum larger than on other parts. Pronotum, seen from above, forming an evenly and barely curved line, laterally with right-angled tooth. Metanotum laterally each with small spine. Propodeum apically with various edges, forming larger and smaller fields. Terga I–VI with marked and large, irregular punctures, 0.2–1x diameters apart, other terga denser punctate. Basal third of terga less dense punctate than rest. Terga I–III laterally with double apical edge, barely visible on terga I and III. Tergum VII with apical narrow teeth, as long as midocellar diameter. Terga medially with small rounded bulge, as large as average diameter of a mesonotal puncture, and with a row of silver setae, as long as lateral teeth.

Female: unknown.

Derivatis nominis: The species is named in honour of Michael Ohl from Berlin, Germany, a specialist of sphecids.

Genus *Tachytes* Panzer, 1806

Identification: Guichard, 1994a. Pulawski's revision (1962) includes all Arabian species except *arabicus* Guichard, 1994, from Saudi Arabia.

***Tachytes argyreus* (F. Smith, 1856)**

Specimens examined: Al-Ajban, 7♂, 21.xii.2006, leg. AvH.

Distribution: North Africa, Arabia to Central Asia (Guichard, 1994a). New to the UAE.

***Tachytes archacophilus* Pulawski, 1962**

Distribution: Egypt, Jordan, Israel, Saudi Arabia, Oman, UAE (Guichard, 1994a).

***Tachytes cameronianus* Morice, 1897**

Specimens examined: Al-Ajban, 2♀, 21.xii.2006, leg. AvH.

Distribution: Egypt, Israel, Saudi Arabia, Oman (Guichard, 1994a). New to the UAE.

***Tachytes comberi* Turner, 1917**

Plate 137

(= *patrizii* Guiglia, 1932, in Pulawski, 1962).

Specimens examined: Desert farm, 2♂, 12.iii.2008, leg. MH. Sharjah Desert Park, 1♂, 12.iii.2008, leg.

MH. Sharjah/Tawi as-Saman oasis, 2♂, 19.iii.2007, leg. J. Batelka. Sharjah, 1♀, 20.vi.2005, leg. AvH.

Distribution: North Africa, Mauretania, Saudi Arabia, Oman, UAE (Guichard, 1994a).

***Tachytes diversicornis* Turner, 1918**

Plates 138–139

Specimens examined: Al-Ajban, 1♀, 24.iv.2006, leg. AvH. Dubai/al-Awir, Dubai/Nakhalai, 4♂, 4♀, iv–v.1984, leg. ES.

Distribution: North Africa, Pakistan, Yemen, Oman, UAE (Guichard, 1994a).

***Tachytes niloticus* Turner, 1918**

Plate 140

Specimens examined: 26 specimens. Al-Ajban, N of Ajman, Dubai/al-Awir, Dubai/Nakhalai. Flight period: April, May, August, October.

Distribution: North Africa, Tajikistan, Saudi Arabia, Oman (Guichard, 1994a). New to the UAE.

***Tachytes priesneri* Pulawski, 1962**

Specimens examined: N of Ajman, 1♂, 17.xiii.2008, leg. AvH.

Distribution: Northern Sudan, Oman (Guichard, 1994a). New to the UAE.

***Tachytes pygmaeus* Kohl, 1888**

Plate 141

Specimens examined: 26 males and 6 females. Dubai/al-Awir; Dubai/Nakhalai. Flight period: March–May.

Distribution: North Africa, northern India, Saudi Arabia, Oman, UAE (Guichard, 1994a).

***Tachytes saharicus* Pulawski, 1962**

Distribution: North Africa, Saudi Arabia, UAE (Guichard, 1994a).

***Tachytes serapis* Pulawski, 1962**

Specimens examined: Dubai/al-Awir, 1♀, 12.v.1984, leg. ES.

Distribution: North Africa, Saudi Arabia, UAE (Guichard, 1994a).

***Tachytes trichopygus* Pulawski, 1962**

Distribution: Egypt (Sinai), Israel, UAE (Guichard, 1994a).

Family **Sphecidae** s. str.

Identification: Guichard, 1988a.

Genus ***Ammophila*** Kirby, 1798

***Ammophila barbara* Lepeletier, 1845**

Plate 142

Specimens examined: Wadi Bih (dam), 3♂, 1♀, 19.iii.2009, leg. CSE.

Distribution: North Africa to Arabia, Turkey (Guichard, 1988a). New to the UAE.

***Ammophila dolichodera* Kohl, 1883**

Plate 143

Specimens examined: 9 specimens. Wadi Bih (dam), Wadi al-Helo/near tunnel; Wadi Maidaq, Wadi Safad, Wadi Wurayah. Flight period: March.



Plates 136–137. 136: *Synnevrus ohli* Schmid-Egger nov. spec., male, lateral view, L = 4.0 mm;
137: *Tachytes comberi* Turner, male lateral view, L = 13 mm.



Plates 138–139. *Tachytes diversicornis* Turner, female, L = 9.5 mm. 138: Lateral view; 139: Head.



Plates 140–141. 140: *Tachytes niloticus* Turner, female, lateral view, L = 11 mm; 141: *Tachytes pygmaeus* Kohl, male, lateral view, L = 8.7 mm.



Plate 142. *Ammophila barbara* Lepeletier, male, lateral view, L = 15 mm.

Distribution: South Africa northwards to Mali and Niger, Arabian Peninsula (Guichard, 1988a). New to the UAE.

***Ammophila erminea* Kohl, 1901**

Plate 144

Specimens examined: 6 specimens. Jebel Hafit/S of al-Ain, Sharjah/Tawi as-Saman oasis, Wadi Bih (dam), Wadi Wurayah. Flight period: March.

Distribution: North Africa, Israel, Jordan, Saudi Arabia, UAE (Guichard, 1988a).

***Ammophila gracillima* Taschenberg, 1869**

Specimens examined: Al-Ajban, 1♂, 7–21.viii.2008, leg. AvH.

Distribution: North Africa, Israel and Arabia (Guichard, 1988a). New to the UAE.

***Ammophila haimatosoma* Kohl, 1883**

Plate 145

Specimens examined: Dubai/Nakhalai, 2♂, 20.iv.1984, leg. ES.

Distribution: North Africa, Israel and Arabia (Guichard, 1988a). New to the UAE.

***Ammophila insignis egregia* Mocsary, 1881**

Specimens examined: Wadi Wurayah, 1♂, 19.iii.2009, leg. CSE.

Distribution: Israel, Syria, Arabia (Guichard, 1988a); the nominate form in Africa south of Sahara. New to the UAE.



Plates 143–144. 143: *Ammophila dolichodera* Kohl, male, lateral view, L = 21 mm; 144: *Ammophila erminea* Kohl, male, lateral view, L = 21 mm.

***Ammophila poecilocnemis* Morice, 1900**

Plate 146

Specimens examined: 50 specimens. Jebel Hafit/S of al-Ain; Wadi Bih (dam), Wadi Hayl; Wadi al-Helo/near tunnel; Wadi Madaq, Wadi Shawkah, Wadi Wurayah. Flight period: November–March.
Distribution: North Africa, Israel, Oman, Saudi Arabia, UAE (Guichard, 1988a).

***Ammophila rubripes* Spinola, 1838**

Plate 147

Specimens examined: 18 specimens. Al-Ajban. Flight period: April, July, November.
Distribution: North Africa to Sahel, widespread and common in Arabia including the UAE (Guichard, 1988a).

Genus *Chalybion* Dahlbom, 1843***Chalybion flebile* Lepeletier, 1845**

Plate 148

Specimens examined: Wadi Madaq, 2♀, 19.iii.2009, leg. CSE. Wadi Wurayah, 1♂, 20.iii.2009, leg. O. Berg.
Distribution: Mediterranean area, Iran, Iraq, Arabia including the UAE (Guichard, 1988a).

Genus *Chlorion* Latreille, 1802***Chlorion semenowi occidentale* de Beaumont, 1962**

Distribution: Egypt, Israel, Saudi Arabia, Oman, UAE (Guichard, 1988a).

***Chlorion hirtum* Kohl, 1885**

Distribution: Egypt, Israel, Jordan, Arabia, UAE (Guichard, 1988a).

***Chlorion funereum* Gribodo, 1879**

Distribution: North Africa, Jordan, Saudi Arabia, Yemen, UAE (Guichard, 1988a).

Genus *Parapsammophila* Taschenberg, 1869***Parapsammophila algira* Kohl, 1901**

Specimens examined: Wadi al-Helo/near tunnel, 1♂, 19.iii.2009, leg. CSE.
Distribution: North Africa, Saudi Arabia, Oman (Guichard, 1988a). New to the UAE.

***Parapsammophila dolichostoma* Kohl, 1901**

Specimens examined: 13 specimens. Jebel Hafit/S of al-Ain, Wadi Bih (dam), Wadi Hayl, Wadi al-Helo/near tunnel, Wadi Shawkah, Wadi Wurayah. Flight period: March.
Distribution: Sahara, Egypt, Saudi Arabia, Yemen (Guichard, 1988a). New to the UAE.

***Parapsammophila turanica* Morawitz, 1890**

Specimens examined: Mahafiz, 1♀, 19.iii.2009, leg. CSE. Sharjah Desert Park, 2♀, 12.iii.2008, leg. MH. Wadi Wurayah, 1♀, 20.iii.2009, leg. O. Berg.
Distribution: North Africa, southern Asia, Arabia including the UAE (Guichard, 1988a).

Genus *Podalonia* Fernald, 1927***Podalonia tydei* Le Guillon, 1841**

Plates 149–150

Specimens examined: 14 specimens. Al-Ajban, Dubai/al-Awir; Ra's al-Khaimah Airport, Sharjah/15 km N of ad-Dhaid. Flight period: March–June.
Distribution: Africa, southern Europe, Arabia including the UAE (Guichard, 1990).



Plates 145–146. 145: *Ammophila haimatosoma* Kohl, male, lateral view, L = 20 mm; 146: *Ammophila poecilocnemis* Morice, female, lateral view, L = 19 mm.



Plates 147–148. 147: *Ammophila rubripes* Spinola, male, lateral view, L = 20 mm; 148: *Chalybion flebile* Lepeletier, female, dorsal view, L = 18 mm.



Plates 149–150. *Podalonia tydei* Le Guillon. 149: Male, lateral view, L = 18 mm; 150: Female, lateral view, L = 20 mm.

Genus *Prionyx* Vander Linden, 1827*Prionyx crudelis* F. Smith, 1856

Distribution: Africa, India, western Asia to Greece, Arabia including the UAE (Guichard, 1988a).

Prionyx kirbii Vander Linden, 1827

Plate 151

Specimens examined: Wadi Wurayah, 1♂, 19.iii.2009, leg. CSE.

Discussion: The species was mentioned as *Prionyx kirbii* subspec. *marginatus* F. Smith, 1856, by Guichard, 1988a). In my opinion *marginatus* is a colour form differing only by red petiole, occurring in the arid areas of Africa and Arabia.

Distribution: Africa, India, Arabia (Guichard, 1988a). New to the UAE.

Prionyx niveatus Dufour, 1863

Plate 152

Specimens examined: Um al-Quwain, 2♂, 28.vi.2008, leg. AvH.

Distribution: North Africa, western Asia, Arabia including the UAE (Guichard, 1988a).

Prionyx trichargyrus Spinola, 1838

Specimens examined: Sharjah Desert Park, 1♀, 28.xii.2006, leg. AvH.

Distribution: West and North Africa, Saudi Arabia (Guichard, 1988a). New to the UAE.

Prionyx viduatus (Christ, 1791)

Specimens examined: Near Qurayyah, 1♂, 7.viii.2008, leg. AvH.

Distribution: Africa, temperate Asia to China, Arabia including the UAE (Guichard, 1988a).

Genus *Sceliphron* Klug, 1801*Sceliphron madraspatanum pictum* F. Smith, 1856

Plate 153

Specimens examined: 10 specimens. Al-Ajban, Dubai/al-Awir, Fujairah, Hatta, Wadi Hayl, Wadi Madaq, Wadi Wurayah. Flight period: April–September.

Discussion: *Sceliphron madraspatanum pictum* is a markedly yellow coloured form of *madraspatanum* and occurs in southwest and central Asia. Its taxonomical state as a subspecies is questionable. In my opinion it is a light colour form and not a subspecies. I have examined several specimens from Iraq and other places of origin, which partly represent intermediate forms between *pictum* and the Mediterranean subspec. *S. madraspatanum tubifex* Latreille, 1809. The latter consequently also has to be treated as forma.

Sceliphron rectum pulchellum Gussakovskij, 1933

(as *pulchellum rectum* Kohl, 1918, in Guichard, 1988a).

Distribution: Iran, India, Pakistan, UAE (Hensen, 1987)

Sceliphron spirifex Linnaeus, 1758

Distribution: Africa, southern Europe, Asia, widespread in Arabia, including the UAE (Guichard, 1988a).

Genus *Sphex* Linnaeus, 1758*Sphex argentatus* Fabricius, 1787

Specimens examined: Dubai/al-Awir, 3♂, 5.v–30.vi.1984, leg. ES.



Plates 151–152. 151: *Prionyx kirbii* Vander Linden, male, lateral view, L = 15 mm; 152: *Prionyx niveatus* Dufour, male, lateral view, L = 13 mm.



Plate 153. *Sceliphron madraspatanum pictum* F. Smith, male, laterodorsal view, L = 18 mm.

Recognition: The species is not included in the key of Guichard (1988a) and might have been mixed with the following species by that author. The taxonomy of African and western Asian *Sphex* is not finally solved. I recognize *argentatus* by the following character combination within the genus *Sphex*: Gaster black, scutellum bituberculate, wings transparent, basally and apically darkened, face with black erect setae. *Sphex fumicatus* (in my sense) is similar but lacks black setae of face. Face is covered with long white setae only.

Distribution: Widespread in southern Asia and Africa (Pulawski, internet database). New to the UAE. Also, there is an unpublished record from Oman (male, Qurayat, 17.v.2004, leg. et coll. Schlaefle).

***Sphex fumicatus* Christ, 1791**

Distribution: Widespread in southern Asia and Africa (Pulawski, internet database) “The most common and widespread *Sphex* species in Arabia” including Oman and the UAE (Guichard, 1988a). See also comments at *Sphex argentatus*. I have examined specimens from Egypt, Turkey and Oman.

***Sphex pruinus* Germar, 1817**

Distribution: Mediterranean area, Saudi Arabia, UAE (Guichard, 1988a).

***Sphex flavipennis* Fabricius, 1793**

Distribution: Mediterranean area to Afghanistan, UAE (Guichard, 1988a).

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Order Hymenoptera, family Crabronidae

Genera *Trypoxylon*, *Pseudomicroides* and *Belomicroides*

Alexander V. Antropov

INTRODUCTION

This contribution concerns three genera of Crabronidae. Most other Crabronidae genera are treated by Schmid-Egger (2011). See this contribution for general aspects about Crabronidae, sources of material, methods, etc. *Trypoxylon* Latreille, 1796, has a worldwide distribution with about 630 described species. *Pseudomicroides* Antropov, 2001, has an old world distribution and contains 15 species (including the species described here). *Belomicroides* Kohl, 1899, contains 16 species with an African and Arabian distribution only.

Since two revisions of the *Trypoxylon scutatum* species-group and of the genus *Pseudomicroides* have been published (Tsuneki, 1978; Antropov, 2001) were published, supplementary data about those genera in the eastern Mediterranean region and southwest Asia, with particular reference to the United Arab Emirates, were obtained. The present publication is devoted to the description of new species of digger wasps from this region: *Trypoxylon splendidum* nov. spec. (Crabronidae, Trypoxylini), widely distributed in the eastern Mediterranean region, *Pseudomicroides arabicus* nov. spec. and *Pseudomicroides applanatus* nov. spec. (Crabronidae, Oxybelini) from the United Arab Emirates.

MATERIALS AND METHODS

The studied specimens are deposited in the collections of the following institutions:

- BMNH The Natural History Museum, formerly British Museum (Natural History), London, UK;
- CSE Dr. Christian Schmid-Egger personal collection;
- MSNT Museo Regionale di Scienze Naturali, Torino, Italy;
- OÖLM Oberösterreichs Landesmuseum, Linz, Austria;
- RMNH Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands;
- TAU Zoological Museum, Tel Aviv University, Israel;
- UAEIC United Arab Emirates Invertebrate Collection, UAE;
- ZMHU Zoologisches Museum der Humboldt Universität, currently Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany;
- ZMMU Zoological Museum, Moscow Lomonosov State University, Moscow, Russia.

The specimens collected within the framework of the 'UAE Insect Project' are divided between CSE, UAEIC, ZMHU and ZMMU.

The studied type specimens of *Trypoxylon aegyptium* Kohl, 1906, and *Trypoxylon arabicum* Gussakovskij, 1936, are deposited in the collections of the Naturhistorisches Museum, Wien, Austria and the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia respectively.

Abbreviations used in the descriptions: Clw:Clh – ratio of clypeal width to its height; CMLw:CMLh – ratio of clypeal medial lobe width to its height; d – relative distance between punctures; dFSh:vFSh – ratio of height of frontal shield upper area (above the point of bifurcation of outward branch carina) to height of its lower area; FSh:FSw – ratio of frontal shield height to its maximum width; G1L:W – ratio of 1st tergite maximum length (measured from posterior end of vertical joining plate) to its maximum width (dorsal view); Hw:Hh –

ratio of head width to its height (frontal view); IOD – ratio of distance between inner eye orbits at level of medial ocellus to maximum distance at level of eye emarginations (in the case of *Trypoxylon*) and at level of lower margins of antennal sockets; OOd:Od:Pod – ratio of distance between inner eye orbit and outer margin of lateral ocellus to diameter of lateral ocellus and distance between lateral ocelli; VA – angle between straight lines connecting lower apex of frontal shield and points of bifurcation of outward branch carinae; Ø – relative diameter of punctures.

For the terms used in the description of *Trypoxylon* frontal shield, see Tsuneki (1978)

Habitus photographs do not contribute much to the recognition of the species, but for the sake of the general reader some of them are presented as annexes.

SYSTEMATIC ACCOUNT

Genus *Trypoxylon* Latreille, 1796

Trypoxylon splendidum Antropov **nov. spec.**

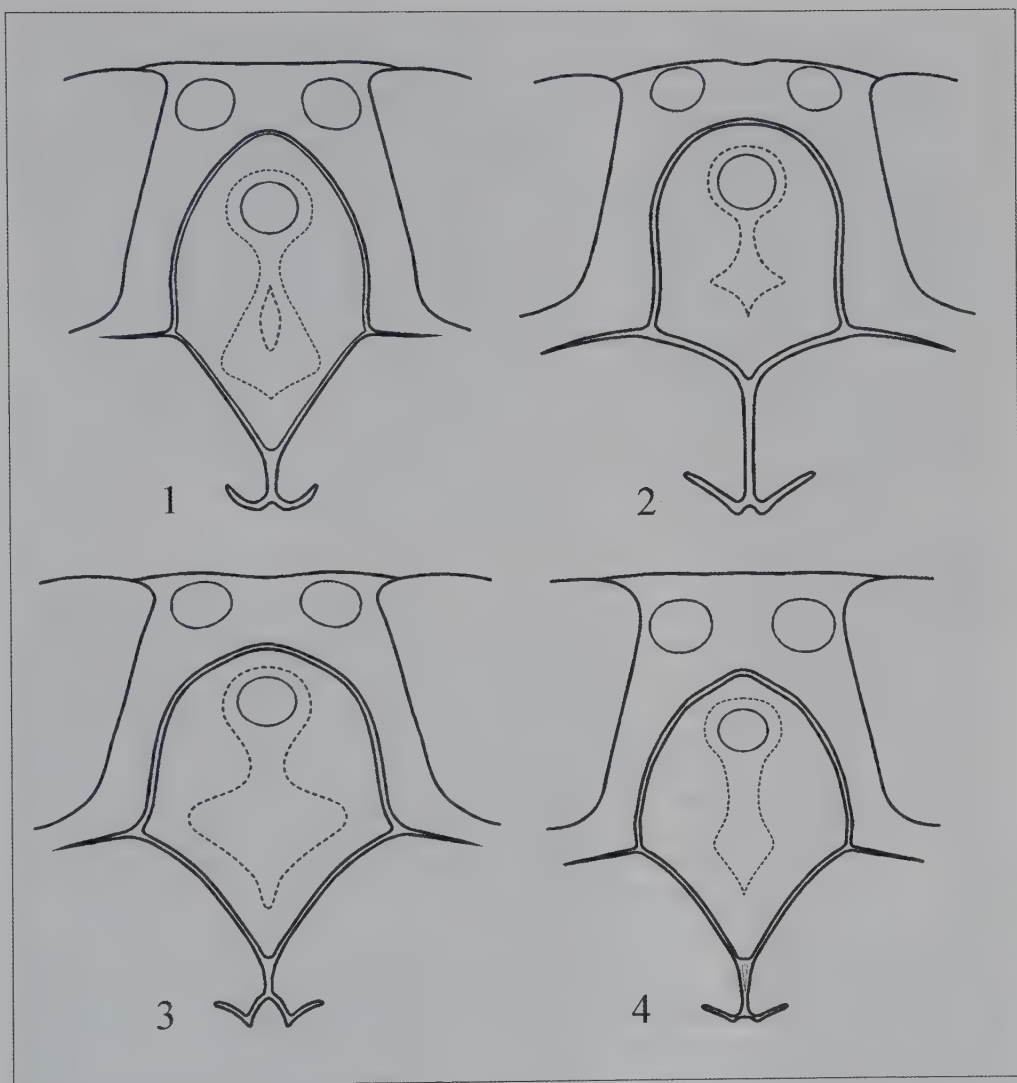
Plates 1–6, Figures 4, 6, 10

Trypoxylon aegyptium Kohl, 1906: de Beaumont, Bytinski-Salz & Pulawski, 1973:20 (Israel) [partim];

Trypoxylon arabicum Gussakovskij, 1936: Guichard, 1980: 228 (Oman) [partim].

Specimens examined: Holotype ♀: SAUDI ARABIA, “W. Saudi Arabia. Muhayl, 8.I.1983. A. Pittaiday” [error for A. Pittaway] (*T. arabicum* – Guichard det. x.1986) [BMNH]. Paratypes: 18♂, 14♀. UNITED ARAB EMIRATES: 1♀, Hatta (Htl), 28.iv.1989, leg. I.L. Hamer (*T. scutatum* – Guichard det. 1989) [BMNH]; 1 female, Uytinah, 28.viii.1985, leg. I.L. Hamer (*T. scutatum* – Guichard det.) [ZMMU]; 1♂, Dubai, Nakhalai, 21–25.iv.1984. Malaise trap, leg. E. Sugden [ZMHU]. OMAN, 1♀, Al Qabil, 15.iv.1985, leg. I.L. Hamer (*T. arabicum* – Guichard det. 1986) [ZMMU]; 1♂, Wadi Quryat, Agr. St., 5.iii.1976, K. Guichard” (*T. arabicum* – Guichard det. 1980) [ZMMU]. QATAR: 1♀, Al Shahanyeh, 15.viii.1980, leg. C.G. Roche (*T. arabicum* – Guichard det. 1980) [BMNH]; 1♂, Al Shahanyeh, 13.vi.1980, leg. C.G. Roche (*T. arabicum* – Guichard det. 1980) [BMNH]. GREECE: 1♀, Rhodes, nr. Lindhos, 36°06'N 28°04'E, 22.viii.1975, leg. Ph. Pronk (75 048) [RMNH]; 1♂, 1♀, Rodi. Cremasti. 2.ix.1933. leg. A. Mochi [MSNT]. TURKEY: 1♀, Pr. Hakkari. W Uludere, 900–1400 m, 9.viii.1982, leg. W. Schacht [OÖLM]. LEBANON: 1♂, Bekaa, Mrah Bakarach, 14.viii.1952 [MSNT]. SYRIA: 1♂, Ailr Hafra. 25.viii.1954 [MSNT]. ISRAEL: 4♂, 3♀, Hazeva, 15.vii.1982, leg. A. Hefetz (1♀, *T. aegyptium* – Guichard det. 1991) [BMNH, ZMMU]; 1♀, Arava Valley, Hazeva, 30°46.88'N 35°14.56'E, 5.v.1995, sh2, leg. M. Irwin [ZMHU]; 1♂, Arava Valley, Har Badad, Wadi Neqarot, 30°36.09'N 35°03.04'E, 8.iv.1995, sh28, leg. M. Irwin, [ZMHU]; 1♂, Nahal Uvda, Shaharut Junc, 2.v.1986, leg. A. Freidberg [TAU]; 1♀, Wadi Qilt, 24.iv.1940, leg. H. Bytinski-Salz (*T. aegyptium* – Pulawski det. 1971) [TAU]; 1♀, Tel Aviv, 27.viii.1946. leg. H. Bytinski-Salz (*T. aegyptium* – Pulawski det. 1971) [TAU]; 1♂, Tiberias, 1.vii.1945. leg. H. Bytinski-Salz (*T. aegyptium* – Pulawski det. 1971) [TAU]; 1♂, Jerusalem, Beth Hakerem, Wadi Kuaz, 3.vi.1950. leg. O. Theodor (*T. scutatum* – J. de Beaumont det. 1951) [TAU]. PALESTINE: 1♂, 1♀, 30 km S of Eilat, 4.ix.1976, leg. A. Freidberg [TAU]; Jericho, 15.xi.1942. leg. H. Bytinski-Salz (*T. aegyptium* – Pulawski det. 1971) [TAU]. EGYPT: 1♂, Sinai, W. Sial, 10.vii.1969, leg. A. Freidberg [TAU]; 1♂, Sinai, S. Katharina, 1500 m, 18.v.1970, leg. H. Bytinski-Salz (*T. aegyptium* – Pulawski det. 1971) [TAU].

Description. Female holotype, body length 12.5 mm, forewing length 5.3 mm. Head broader than high (Hw:Hh=1.2:1); inner eye orbits convergent below, with deep emarginations (IOD=15:46:10). Frontal shield outlined with distinct carinae, only rarely somewhat smoothed dorsally; upper lateral carinae uniformly curved outwards, lower carinae always more or less curved inwards (FSh:FSw=10:14, dFSh:vFSh=15:10, VA=85°); inner surface of frontal shield convex laterally, concave along medial line, but without medial furrow and preapical pit; outward branch carinae distinct; enclosed space on the end of medio-apical



Figures 1–4. Frontal shield of female. 1: *Trypoxylon aegyptium* Kohl; 2: *Trypoxylon scutatum* Chevrier; 3: *Trypoxylon arabicum* Gussakovskij; 4: *Trypoxylon splendidum* nov. spec.

carina very small, less than half of diameter of medial ocellus. Clypeus mainly slightly convex, flattened along naked apical border, evenly roundly triangular anteriorly; apical border wider than diameter of lateral ocellus ($Clw:Clh=1.7:1$). Vertex between lateral ocelli slightly convex, flattened behind ocellar triangle ($OOD:Od:POd=1:5.2:4.6$). Temples narrow, evenly convex. Occipital carina thin and distinct, almost completely circular, weakly interrupted ventrally; ventral interruption and distance between occipital and hypostomal carinae approximately equal to diameter of lateral ocellus. Mandible unmodified, without separate teeth and lobes. Antennae unmodified; 1–9 flagellar articles gradually shortening, though even preapical article approximately 1.2 times longer than thick; apical flagellomere

more than twice as long as thick. Pronotum with deep transverse furrow between anterior part and convex laterally and flattened anteriorly, pronotal collar ending with distinct translucent posterior border; pronotal lobes rounded, ecarinate. Scutum uniformly convex; admedial lines short, only 2–3 times longer than translucent posterior border of pronotal collar; parapsidal lines absent; adlateral lines narrow, groove-like. Scutellum flattened, ecarinate laterally. Postscutellum short, transverse. Mesopleuron uniformly convex; only postspiracular carina and episternal suture present. Legs unmodified. Propodeum with thin but distinct lateral keels and distinct dorsal enclosure margined by deep transversely carinate concavity, most deep posteriorly; hind side uniformly weakly rounded, with elongate narrow medial pit; lateral sides flat. First gastral segment long (G1L:W=4.8:1), evenly broadened posteriorly; tergite 1 envelopes laterally sternite 1 almost to vertical joining plate; apical tergite acute, without pygidial structures; gastral sternites unmodified.

Sculpture. Surface of clypeus, lower frons, and eye emarginations hardly visible because of dense pubescence, though clypeus behind smooth and shiny apical border densely and delicately micropunctate and mat; upper frons laterad from frontal shield evenly punctate, though punctures diminishing near eye orbits; vertex between lateral ocelli similarly densely punctate ($d \leq \emptyset$) and mat; head behind ocellar triangle and temples almost invisibly micropunctate, with shiny surface; frontal shield densely and evenly punctate, interspaces half-mat, slightly shiny along medial line.

Pronotal collar punctate as frontal shield, though interspaces shiny; scutum evenly and very delicately punctate, with polished interspaces ($d=2-4\emptyset$ or more); scutellum with sparser and irregular punctures, mainly posteriorly, with shiny surface; postscutellum densely and irregularly wrinkled; mesopleuron with punctures as on scutum or somewhat larger ventrally, interspaces shiny without visible microsculpture; metapleuron anteriorly smooth and shiny, only dorsally with thin longitudinal wrinkles. Propodeal dorsal enclosure shiny, delicately carinate basally, with wide transversely cellulate medial furrow and irregularly transversely carinate rest of surface; lateral parts between enclosure and lateral keels half-mat, with transverse carinae forming irregular cells; hind side almost invisible because of dense pubescence, except behind dorsal enclosure transversely carinate; lateral sides shiny, densely and regularly obliquely striate, with sparse irregular punctures posteriorly. Gastral segments micropunctate, half-mat, only apical tergite with smooth medial line.

Pubescence. Clypeus mainly, frons below frontal shield, and eye emarginations covered with very dense appressed and strongly shiny hairs not longer than diameter of medial ocellus; frontal shield with a few similar hairs along medial line below medial ocellus; medio-apical carina below with 3–4 long coarse bristles, 2 of which begin from small enclosed space; vertex weakly pubescent with short semi-erect hairs; occiput with long setae directed upwards; temples with longer setae directed downwards but not covering sculpture of surface; lower temples with more erect setae equal or even longer than thickness of fore femur. Fore margin of pronotum with sparse and straight setae directed radially backwards and twice longer than diameter of medial ocellus; pronotal collar dorsally and hind pronotal border with erect setae, approximately 1.5 times shorter than those on fore margin; pronotal lobes with similar, but appressed and directed backwards setae; scutum with weaker pubescence, developed mainly at anterior angles, lateral margins and posteriorly, where semi-erect setae approximately equal to diameter of lateral ocellus; pubescence of medial part of scutum short, erect, weakly visible, approximately twice shorter than diameter of medial ocellus; scutellum pubescent as scutum, mainly along lateral and posterior margins; postscutellum with setae similar to those on pronotal collar, but denser and covering its sculpture; mesopleuron with



Plates 1–6. *Trypoxylon splendidum* nov. spec. 1: Head of female in frontal view; 2: Thorax in dorsal view; 3: Thorax in lateral view; 4: Propodeum in dorsal view; 5: Head of male in frontal view; 6: Apical part of flagellum of male in dorsal view.

setae similar to those on pronotal collar, almost erect and directed obliquely downwards and backwards; metapleuron and propodeal lateral sides and dorsal enclosure bare; dorsal propodeal part between dorsal enclosure and lateral keels and whole hind side covered with relatively dense setae slightly longer or equal to hind basitarsomere; setae of hind side directed radially from medial pit; gastral segments covered mainly with very short semi-erect or appressed (on 4th–5th tergites) hairs; a few elongate silvery setae present on 1st tergite basally; 3rd–5th sternites with long sparse erect brownish setae preapically; 6th sternite with similar setae on whole surface. Legs with short semi-erect hairs approximately twice shorter than diameter of lateral ocellus, mainly developed on ventral side of fore and mid tibiae and hind side of coxae and trochanters. Anterior edge of hind wing with separated row of hamuli containing 5 hooks in proximal and 3 hooks in distal group.

Colour. Body mainly black. Apical clypeal border brown; mandible mainly brown, slightly darkened basally and apically; palpi reddish-brown; posterior border of pronotal collar translucent, discoloured, whitish; tegulae mainly translucent, reddish-brown at posterior corners; wing scales reddish, with brown medial marking; legs mainly black, except brown apical markings of femora, tibiae, and tarsomeres; veins mainly from brown to dark brown except reddish-brown at the wing base and almost black stigma.

Male paratype, body length 12.5 mm, forewing length 5.0 mm. Mainly similar to female externally, differing in the features connecting with sex (Hw:Hh=1.2:1; IOD=17:42:10; FSw:FSh=10:13; dFSh:vFSh=15:10; VA=85°). Distance between inner eye orbit and lateral ocellus longer (OOd:Od:POd=31:24:10); clypeus shorter (Clw:Clh = 2:1), waved anteriorly, with medial and lateral lobes moderately projecting forwards; preapical flagellomere shorter than thick; apical flagellomere distinctly longer than three (sometimes even four) preceding together; gastral 1 segment comparatively shorter (GlL:W=4.1:1); gastral sternite 8 with weak lateral widenings, posteriorly with a pair of obliquely truncate and weakly curved to medial line lateral projections, separated by large emargination approximately 1.5 times broader than deep; lateral and posterior margins bearing bunches of long bristles.

Variation. Body length 10.0–13.0 mm in females and 9.5–12.5 mm in males. Scutal punctures vary from small but distinct to practically invisible, particularly in smallest females and males. Apical flagellomere in males distinctly may be equal to 3.5–4.5 preceding ones together.

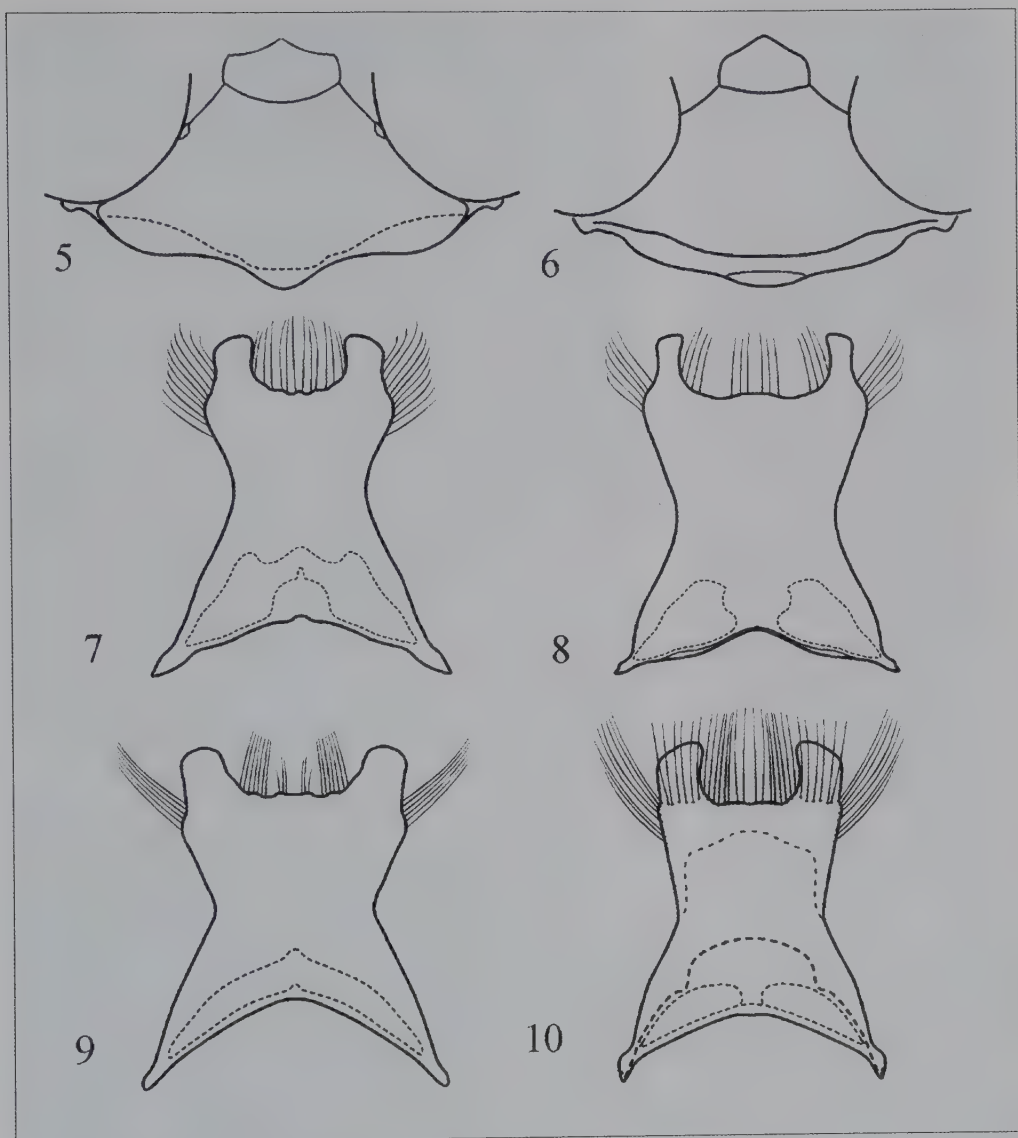
Remarks: The following peculiarities of the described new species differentiate it from other members of the species-group *Trypoxylon scutatum*: Relatively short frontal shield with acute ventral angle and lower carinae curved inside, and very delicate punctures of scutum and mesopleurae with shiny interspaces lacking microsculpture.

Distribution: Widely distributed in the eastern Mediterranean sea-coast, reaching the Persian Gulf in the East.

Etymology: After *splendidus*, Latin for ‘shiny’, referring to the surface of the thorax.

Key to the *Trypoxylon scutatum* species-group of the eastern Mediterranean region and southwest Asia

- 1 Frontal shield strongly elongate (FSh:FSw=1.6:1), with elliptical medial pit, straight lower carinae, acute ventral angle (VA=77°), and small enclosed space (Fig. 1). Scutum and mesopleuron moderately punctate by small punctures, with interspaces microstriate, mat or half-mat. Male gastral sternite 8 with obliquely truncate apicolateral projections separated by almost semicircular apical emargination (Fig. 7) *Trypoxylon aegyptium* Kohl, 1906



Figures 5–10. 5–6. Clypeus of male. 5: *Trypoxylon arabicum* Gussakovskij; 6: *Trypoxylon splendidum* nov. spec. 7–10. Gastral sternite 8 of male. 7: *Trypoxylon aegyptium* Kohl; 8: *Trypoxylon scutatum* Chevrier; 9: *Trypoxylon arabicum* Gussakovskij; 10: *Trypoxylon splendidum* nov. spec.

- Frontal shield moderately elongate ($\text{FSh}:\text{FSw}=1.2\text{--}1.4:1$), without medial pit, with lower carinae curved inwards, and ventral angle from nearly straight to obtuse ($\text{VA}>85^\circ$). Scutum and mesopleuron with interspaces between punctures smooth and shiny 2
- 2 Frontal shield of various proportions ($\text{FSh}:\text{FSw}=1.1\text{--}1.3:1$), with strongly obtuse ventral angle ($\text{VA}=110\text{--}130^\circ$), and small enclosed space (Fig. 2). Scutum and mesopleuron with middle-size punctures. Gastral segment 1 comparatively short, particularly in male. Male

- gastral sternite 8 with narrow and obliquely truncate apicolateral projections separated by apical emargination more than twice wider than deep (Fig. 8) *Trypoxylon scutatum* Chevrier, 1867
- Frontal shield with almost straight or straight ventral angle ($VA=85-92^\circ$). Scutum and mesopleuron very coarsely or very delicately punctate. Gastral segment 1 comparatively longer. Male gastral sternite 8 with broader lateral projections 3
- 3 Frontal shield comparatively short (FSh:FSw=1.2:1), with almost straight or straight ventral angle ($VA=89-92^\circ$), and deep and wide enclosed space (Fig. 3). Scutum and mesopleuron very coarsely punctate by deep and large punctures. Male clypeus with triangularly projecting medial lobe (Fig. 5). Male gastral sternite 8 with short and rounded apicolateral projections separated by apical emargination twice wider than deep (Fig. 9). ..
- Frontal shield comparatively longer (FSh:FSw=1.4:1), with more acute ventral angle ($VA=85^\circ$), and small enclosed space (Plates 1 & 5; Fig. 4). Scutum and mesopleuron very delicately punctate by small punctures (Plates 2–3). Male clypeus with short ovally projecting medial lobe (Fig. 6). Male gastral sternite 8 with longer and obliquely truncate apicolateral projections separated by apical emargination 1.5 times wider than deep (Fig. 10). *Trypoxylon arabicum* Gussakovskij, 1936
- Frontal shield comparatively longer (FSh:FSw=1.4:1), with more acute ventral angle ($VA=85^\circ$), and small enclosed space (Plates 1 & 5; Fig. 4). Scutum and mesopleuron very delicately punctate by small punctures (Plates 2–3). Male clypeus with short ovally projecting medial lobe (Fig. 6). Male gastral sternite 8 with longer and obliquely truncate apicolateral projections separated by apical emargination 1.5 times wider than deep (Fig. 10). *Trypoxylon splendidum* Antropov nov. sp.

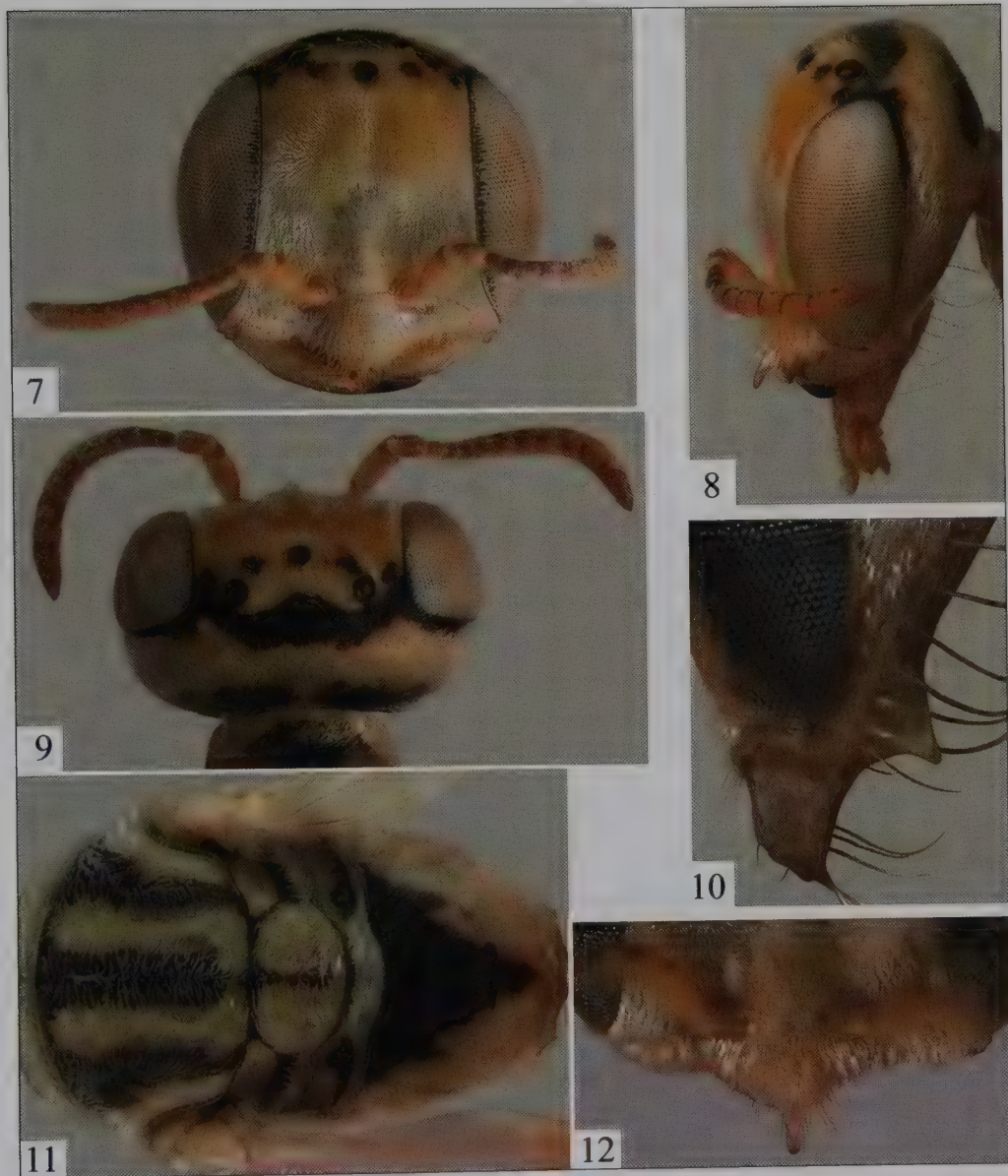
Genus *Pseudomicroides* Antropov, 2001

Pseudomicroides arabicus Antropov nov. spec.

Plates 7–16

Specimens examined: Holotype ♀: United Arab Emirates, "UAE: Al Ain (B'low) [Al 'Ayn], 24–VI–1988. I.L. Hamer", "K.M. Guichard Coll., BMNH (E) 2002-69" [BMNH]. Paratypes: 1♂, Remah [Riyāmah], 2.iv.1987, leg. I.L. Hamer (*Belomicroides* sp. aff. *zimini* (Guss.)). Det. D.B. Baker 1987) K.M. Guichard Coll., BMNH (E) 2002-69 [BMNH]. 1♀, ar-Rafah, 25°43'N 55°51'E, 28.vi.2008, in water traps, leg. A. van Harten. 1♀, North of Ajman, 25°26'N 55°29'E, 23.vii.2008, in water traps, leg. A. van Harten; 2♂, North of Ajman, 30.iv.2008, in water traps, leg. A. van Harten.

Description: Female holotype, body length 4.1 mm. Head frontally rounded, almost equal in width and height (Hw:Hh = 1.1:1) (Plate 7); inner eye orbits moderately divergent above; IOD=1:1.27; frons moderately concave ventro-laterally, flat-convex medially, moderately convex and with shallow medial furrow dorsally; apical border of clypeus narrow; medial lobe of clypeus uniformly convex along middle, at lower part with almost straight sharp conical projection directed ventrad and flattened anteriorly (Plates 8 & 12); vertex uniformly convex, with lateral plates oval, flat, smooth, and distinctly outlined; OOD:OD:POD=5:4:18; temples moderately convex posteriorly, with long sharp triangular prominence ventrally (Plate 10); mandibles weakly thickened apically, without teeth and notches at outer and inner margins; almost all flagellomeres transverse to quadrate, only apical flagellomere almost twice longer than its basal thickness. Pronotal collar uniformly roundly convex, with distinct medial furrow, without transverse ridges; pronotal lobes rounded, without ridges. Scutum uniformly flat-convex; admedial lines narrow, merging into narrow medial ridge, reaching 1/3 of scutal length; parapsidal lines not expressed; adlateral lines in the shape of short and narrow flat stripes; scutellum flat, without lateral ridges; postscutellum short, roundly convex, with smoothed lateral ridges; mesopleuron moderately convex, with only narrow episternal suture present; metapleuron flat, without expressed dorsal flange; fore femur rounded and without ridge along outer margin; hind femur unmodified apico-dorsally. Propodeum uniformly convex; dorsal area not outlined; propodeal hind side with shallow oval and narrowed ventrally medial pit, not bordered with carinae. Gastral tergite 1 with narrow



Plates 7–12. *Pseudomicroides arabicus* nov. spec., female. 7: Head in frontal view; 8: Head in lateral view; 9: Head in dorsal view; 10: Temporal prominence in lateral view; 11: Thorax and propodeum in dorsal view; 12: Clypeus in frontal view.

medio-basal furrow; middle tergites unmodified; tergite 6 flat, outlined with sharp carinae; sternite 6 squeezed laterally, rounded in profile.

Sculpture. Body very densely micropunctate ($d \leq \emptyset$). Frons and vertex mainly mat; temples with shiny interspaces between punctures. Thorax with smaller but also dense punctures;

pronotum and scutum mat; scutellum and postscutellum with smooth interspaces between punctures; mesopleuron, metapleuron, and propodeum laterally and posteriorly vaguely punctate, half-mat; propodeal dorsum with short regular radio-longitudinal carenulae basally and with smooth surface. Abdomen vaguely sculptured, mainly transversely smoothly microstriate; tergite 5 distinctly and densely punctate, tergite 6 with largest but sparse punctures ($d=0.5-3\varnothing$).

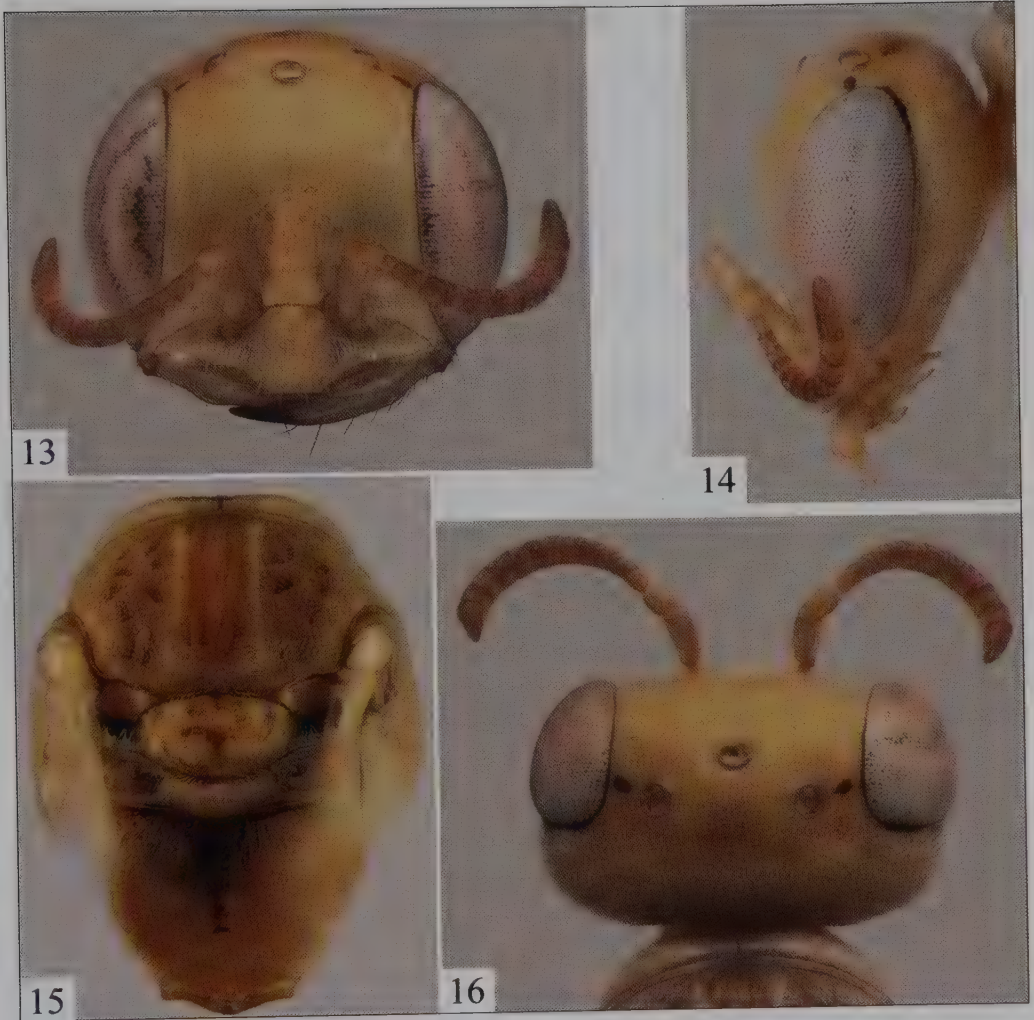
Pubescence. Weak, silvery, mainly half-raised, pressed on lower frons, clypeus, and ventral side of mesopleuron, not concealing surface sculpture. Temporal psammophore consists of sparse thin bristles curved inwards and approximately 1.5 times longer than basal breadth of mandible; longest bristles of mandibular psammophore at least twice longer than basal breadth of mandible; psammophore at fore trochanters and femora not expressed. Digging rake of fore tarsomere consists of four thick raised bristles 1.5 times longer than tarsomere's breadth.

Colour. Body mainly yellow, with weak dark markings. Upper frons yellow, lower frons almost white; clypeus with discoloured apical margin; projection of medial lobe translucent, reddish apically; vertex with curved transverse black strip between and behind lateral ocelli, small black spots at front of lateral ocelli, moderate black border along dorso-posterior edge of eye, and a pair of large black spots above occipital carina (Plate 9); lateral plates black. Mandibles dark brown apically. Scape posteriorly and flagellum dorsally brownish. Pronotum with transverse black spot; pronotal collar yellowish-white, medial furrow dark, semi-translucent. Scutum with medial and two lateral black strips reaching its posterior margin; scutellum with narrow black strip (Plate 11); mesopleuron with dark brown spot in the middle; meso-metapleural suture black. All tarsi yellow, reddish apically. Fore legs completely yellow; middle and hind coxae anteriorly and hind trochanters ventrally with dark brown spots; mid femora with dark brown basal spot; hind femora with dark brown strips ventrally and dorso-posteriorly; mid and hind tibiae with dark brown longitudinal inner spots. Tegulae translucent, with whitish basal spot; wing scales and veins yellowish-white. Propodeum dorsally with large black triangular spot, becoming brownish-black medial strip posteriorly (Plate 11). Gaster reddish-yellow; first tergite with large basal reddish spot, tergites 2-3 with reddish-brown basal strips, tergite 6 reddish apically. First gastral sternite whitish, rest of sternites brownish-red, sternites 1-2 with brown lateral spots, sternites 2-4 with transverse whitish apical strips.

Male paratype, body length 3.6 mm. Mainly similar to female, excluding sex-related features. Head rounded from frontal view, somewhat wider than high ($Hw:Hh = 1.14:1$) (Plate 13); inner eye orbits weakly divergent below; $IOD=1:1.1$; upper frons with weak medial furrow; lateral grooves of vertex small, oval, flat-convex, distinctly outlined; $OOD:OD:POD=6:5:21$ (Plate 16); temples uniformly convex, shorter than eyes (Plate 14) medial lobe of clypeus uniformly convex, truncate apically and with distinct lateral angles; distance between angles shorter than between angle and nearest antennal socket. Antennomeres 6-10 weakly longitudinal, apical segment twice longer than its maximum thickness. Gastral apical tergite truncate apically, distinct margined laterally by sharp carinae.

Sculpture. Body very densely punctate with smooth interspaces between punctures: at upper frons and vertex - $d\leq\varnothing$; at scutum and scutellum - $d\approx\varnothing$; mesopleuron with distinct dorsally and smoothed ventrally punctures - $d\approx\varnothing$; gastral tergite 6 with large apical punctures - $d\approx\varnothing$, apical tergite with large solitary punctures.

Pubescence. Distinctly weaker than in female, mainly appressed, except preapical bristles of gastral sternites; forebasitarsal digging rake consists of 4-5 raised outer bristles 1.5 times



Plates 13–16. *Pseudomicroides arabicus* nov. spec., male. 13: Head in frontal view; 14: Head in lateral view; 15: Thorax and propodeum in dorsal view; 16: Head in dorsal view.

longer than tarsal breadth; temporal psammophore consists of sparse thin bristles curved inwards and sometimes longer than basal breadth of mandible; longest bristles of mandibular psammophore almost twice longer than basal breadth of mandible.

Colour. Body mainly yellow, with distinctly less developed dark markings than in female. Scape yellow, flagellomeres brownish dorsally; vertex completely yellow, with only lateral plates black and narrow brown strip along dorso-posterior eye margin. Pronotum, scutum (except sometimes expressed darkened posteromedial and lateral areas), scutellum, and lateral sides of thorax and propodeum completely yellow; postscutellum yellowish-white. Legs completely yellow, without dark spots; propodeal dorsum with vague triangular brown spot (Plate 15). Gastral segments reddish-yellow, somewhat darker apically; sternite 2 with small lateral brown spots.

Variation. Body length varies from 3.8 to 4.0 mm in females and from 3.1 to 3.7 mm in males.

Remarks. Among all known females of *Pseudomicroides* which have a short prominence of the medial lobe of clypeus, *P. arabicus* nov. spec. is similar to *P. pulawskii* Antropov, 2001, and *P. applanatus* nov. spec. *Pseudomicroides arabicus* nov. spec. differs from both species by the straight and thin clypeal prominence, which is somewhat flattened along anterior side, by the comparatively larger ventral prominence of temples, and by the large triangular black spot and short basal wrinkles on propodeal dorsum. The female of *P. arabicus* nov. spec. also differs from that of *P. pulawskii* by The scutal black strips not being interrupted or accompanied by dark spots. The male of *P. arabicus* nov. spec. is similar to *P. sinaiticus* Antropov, 2001, in having an almost completely light body and differs from it by the evenly punctuate medial lobe of clypeus with distinct lateral angles, by the legs and gaster without brown markings, and by dark brown propodeal dorsum.

Distribution: United Arab Emirates.

Etymology: Species name is a toponym.

***Pseudomicroides applanatus* Antropov nov. spec.**

Plates 17–28

Specimens examined: Holotype ♀: "United Arab Emirates. North of Ajman, 25,43N 55,48E, leg. V. Harten, WT, 30.IV.2008, uae4" [ZMHU]. Paratypes: 4♂, North of Ajman, 25°26'N 55°29'E, 5–16.vii.2008, in water traps. A. van Harten; 5♂, 4♀, North of Ajman, 23.vii.2008, in water traps, leg. A. van Harten; 2♂, 1♀, North of Ajman, 17.x.2008, in water traps, leg. A. van Harten;

Description: Female holotype, body length 4.6 mm. Head from frontal view (Plate 17) almost rounded (Hw:Hh = 1.13:1); inner eye orbits slightly convergent above (IOD = 1:1.17); upper frons flat-convex, with vague medial pit; lower frons with a pair of vertical concavities behind scapes; vertex moderately convex, somewhat concave behind distinctly outlined and slightly convex lateral plates (Ood:Od:POd=6:5:22); temples moderately convex, shorter than eyes (Plate 20), with distinct though not strong triangular prominence rounded apically (Plate 21); clypeus transverse, with narrow apical margin, shortly truncate apically; clypeal lateral lobes flat; medial lobe strongly roundly convex, with relatively short rostral preapical projection, curved and distinctly pressed laterally (Plate 22); mandibles broad, distinctly narrowed apically, with weak ventral swelling; antennae unmodified, with all flagellomeres slightly longer than thick, except apical flagellomere at least 1.5 longer than its basal thickness. Pronotal collar convex, with narrow medial furrow; scutum uniformly flat-convex, scarcely higher than pronotal collar; admedial lines strongly drawn together into weak medial carenula scarcely reaching scutal middle; parapsidal lines not expressed; adlateral lines short, ridge-like. Scutellum flat-convex, weakly carinate laterally, without postero-lateral lobes. Postscutellum transverse, short, convex, with strongly smoothed lateral carinae. Mesopleuron uniformly convex. Metapleuron flat. Propodeum unmodified. Gaster unmodified, with tergites 2–3 weakly concave basally.

Sculpture: Frons and vertex densely micropunctate ($d \approx \emptyset$), with smooth interspaces; projection of medial lobe of clypeus shiny, without sculpture; temples dorsally micropunctate, ventrally with puncture merging into vertical wrinkles. Pronotal collar more delicately micropunctate than vertex, with smooth interspaces; scutum more coarsely punctate than vertex ($d \geq \emptyset$), with smooth interspaces; scutellum micropunctate as vertex; mesopleuron micropunctate as frons. Propodeal dorsum with short longitudinal basal carenulae and the rest of surface vaguely microcellulate and shiny; propodeal hind side very delicately punctate, with slightly narrowed oval medial pit not outlined with lateral carenulae; propodeal hind sides longitudinally microcarinate, smooth between carenulae. Gastral surface shiny; tergites



Plates 17–26. *Pseudomicroides applanatus* nov. spec., female. 17: Head in frontal view; 18: Head in dorsal view; 19: Thorax and propodeum in dorsal view; 20: Head in lateral view; 21: Temporal prominence in lateral view; 22–26: Prominence of clypeus in lateral view (22 = holotype; 23–26 = paratypes).

micropunctate, with interspaces slightly more than diameter of punctures on tergites 1–4; tergite 5 with coarser punctures; tergite 6 outlined laterally with sharp carinae and with largest punctures ($d \leq \emptyset$); sternites vaguely sculptured, without punctures, only sternite 5 shagreened. Pubescence. Moderately developed, silvery, mainly half-raised and not concealing surface sculpture, but pressed on lower frons, clypeus, and ventral side of mesopleuron and concealing surface sculpture. Temporal psammophore consists of sparse thin bristles curved inwards and approximately twice longer than basal breadth of mandible; longest bristles of mandibular psammophore at least twice longer than basal breadth of mandible (Plate 20). Digging rake of fore tarsomere consists of five outer thick raised bristles

2–2.5 times longer than tarsomere's breadth and a pair of outer apical bristles on tarsomeres 2–4 longer than corresponding tarsomere. Scutum with moderate half-raised hairs most expressed along medial line and at antero-lateral angles. Propodeal dorsum almost bare, lateral sides with appressed hairs directed backwards. Gastral tergites with weak half-raised hairs mainly laterally and posteriorly; tergites 5–6 laterally with raised bristles longer than breadth of hind basitarsomere; sternites with short appressed hairs, sternites 2–5 with apical rows of raised bristles longer than breadth of hind basitarsomere.

Colour. Mainly bright, yellowish-white. Upper frons yellow, lower frons almost white; clypeus with discoloured apical margin; projection of medial lobe translucent, red; vertex with irregular transverse black spot between and behind lateral ocelli, small black spots in front of lateral ocelli, triangular black spot between lateral ocellus and nearest eye orbit, and narrow black border along dorso-posterior edge of eye (Plates 17–18); mandibles yellowish-white, dark brown apically; scape completely and flagellum ventrally yellowish-white, flagellum dorsally yellowish-red. Pronotum with dark brown spot in front of collar and vertical brown stripes laterally; scutum with three longitudinal black strips, of which medial strip almost reaching and lateral ones reaching scutal posterior edge; lateral strips somewhat curved and narrowed at adlateral lines (Plate 19); mesopleuron with narrow brown stripes behind pronotal lobes; scutellum and postscutellum mainly yellowish-white; tegulae white basally, with discoloured translucent outer part; wing scales white; wing veins bright, discoloured; legs completely yellowish-white. Propodeum yellowish, with brown hind medial pit. Gastral tergite 1 with basal brown spot; tergite 6 reddish-yellow with red lateral carinae; sternite 2 with a pair of small lateral brown spots; sternite 6 yellowish-red.

Variation. The female paratypes have body lengths from 3.6 to 4.2 mm. Medial projection of clypeus is varying from relatively long and rounded or roundly truncate apically to comparatively short and acute apically (Plates 23–26) but always distinctly appressed laterally.

Male paratype, body length 3.5 mm. Head from frontal view (Plate 27) weakly transverse (Hw:Hh = 1.1:1); inner eye orbits almost parallel (IOD = 1:1) or hardly convergent above; upper frons weakly convex, with weak medial pit; lower frons roundly convex medially, weakly concave laterally, flattened along eye orbits. Clypeus transverse (Clw:Clh=3.2:1); medial lobe of clypeus roundly convex, without projections and carinae (CMLw:CMLh=1:1.4); apical border of medial lobe distinct, its width equal to distance between acute lateral teeth and antennal socket; ratio of antennal socket diameter, intersocket distance, and distance between antennal socket and inner eye orbit is 1:1.8:1.6; lateral lobes of clypeus almost flat. Vertex moderately convex behind ocellar triangle, weakly concave postero-laterally from lateral ocelli (Ood:Od:POd=1:1:3), with thin lateral grooves curved backwards. Temples moderately widened, not longer than eyes (lateral view). Mandible relatively thin, acute apically, with weakly expressed translucent prebasal widening. Antenna unmodified; flagellomeres from 2nd to preapical transverse, though almost quadrate apically; apical flagellomere approximately twice longer than its maximum thickness. Pronotal collar convex, without transverse carinae, medial concavity, and expressed posterior border; pronotal lobes roundly convex, ecarinate; scutum uniformly convex, moderately higher than pronotal collar; admedial lines weakly visible, not reaching 1/3 of scutal length; parapsidal lines not expressed; adlateral lines weak, short groove-like; postscutal suture narrow, ridgeless; scutellum flat-convex, carinate laterally; postscutellum with stronger lateral ridges, slightly concave posteriorly; mesopleuron moderately convex. Legs unmodified. Propodeum short, with dorsum evidently shorter than hind side. Gastral tergites unmodified; apical tergite narrow, truncate apically, with pygidial plate outlined by lateral carinae; gastral sternites unmodified.



Plates 27–28. *Pseudomicroides applanatus* nov. spec., male. 27: Head in frontal view; 28: Thorax and propodeum in dorsal view.

Sculpture. Head and thorax uniformly and densely micropunctate with shiny interspaces on frons, thorax, propodeum, and base of gaster. Medial lobe of clypeus smooth, shiny, and impunctate apically and micropunctate basally; lower frons densely micropunctate ($d \approx \emptyset$); upper frons with larger dense punctures ($d \geq \emptyset$); vertex similarly punctate, though comparatively denser, particularly laterally; temples with dense punctures forming irregular vertical wrinkles below.

Pronotal collar densely punctate as lower frons; scutum evenly punctate as upper frons ($d \geq \emptyset$), comparatively denser at lateral angles and posteriorly, where punctures merging into oblique wrinkles; scutellum slightly sparser punctate, particularly medially ($d = 2-3\emptyset$); mesopleuron densely, but more delicately than scutum punctate ($d \approx \emptyset$). Propodeum basally shiny, with short radial carenulae; dorsal side irregularly microcellulate, irregularly microstriate and polished along posterior margin; hind side microcellulate, with narrow elliptic medial pit; lateral sides not separated by carinae, irregularly microcellulate and micropunctate. Gastral tergites 1–6 evenly micropunctate, between punctures transversely microstriate; tergite 7 with very coarse punctures ($d = 1-2\emptyset$) at least twice larger than those of tergite 1; sternites with hardly visible micropunctures and several larger preapical punctures, interspaces transversely microstriate.

Pubescence. Mainly very short, consisting of appressed or semi-erect microsetae not concealing sculpture. Lateral lobes of clypeus with appressed and flattened silvery setae; temple with hardly expressed psammophore, containing a few setae not longer than scape thickness, only 1–2 ventral setae 1.5 times longer than scape thickness; mandible ventrally with several setae approximately 1.5 times longer than its basal width. Foretarsal digging rake consists of 4–5 erect outer setae on basitarsus twice longer than its thickness, and of apical setae on 2–4 tarsomeres; mid and hind tarsi on outer surface with translucent setae, basitarsomere with setae 1.5 times longer than its thickness; mid tibia on outer surface with several thickened setae shorter than tibial thickness; hind tibia on outer surface with 3 rows of thickened setae with maximum length 2 times more than tibial maximum thickness. Gastral tergites with rather dense appressed microhairs, laterally with a few preapical setae twice longer than hind basitarsus thickness; sternites with similar microhairs and transverse rows of erect preapical setae twice longer than hind basitarsus thickness.

Colour. Head, thorax, and propodeum mainly black; gaster mainly dark brown. Clypeus mainly reddish, with outer angles of lateral lobes whitish-yellow; medial lobe reddish, somewhat darker basally; lower frons light brown above antennal sockets, along inner eye orbits with narrow whitish-yellow vertical stripes hardly reaching eye middle (Plate 27); vertex black or slightly brownish laterally; temples black, slightly reddish-brown near base of mandibles; mandibles mainly whitish, dark brown apically; flagellum yellowish-red ventrally and reddish dorsally; scape completely reddish; frons mainly black. Pronotum black, with anterior part red; pronotal lobes from light brown to whitish-yellow posteriorly; scutellum and postscutellum mainly black or with reddish lateral ridges (Plate 28). All coxae dark brown; fore trochanter reddish; mid and hind trochanters mainly brown; fore femur mainly reddish, brown basally; mid femur reddish-brown at basal half, with apical half of outer surface and completely reddish on inner surface; hind femur mainly brown, reddish apically; fore tibia yellowish-red on outer surface, whitish basally, reddish on inner surface; mid tibia mainly reddish, whitish-yellow on outer surface, whitish basally; hind tibia on inner surface with brown spot, reddish on outer surface and apically, whitish basally; tarsi light, yellowish-red. Tegula translucent, with white spot basally; wing scales white; wing veins strongly discoloured, whitish. Gastral tergites brown, with discoloured apical bands; apical segment brownish-red; sternites light brown.



Plates 29–33. *Belomicroides maurusius* Pate, male. 29: Head in frontal view; 30: Prothorax in ventral view (outer forecoxal depressions are shown); 31: Thorax and propodeum in dorsal view; 32: Head in ventro-lateral view (prebasal lobe of mandible is shown); 33: Abdominal tergites 2–6 (basolateral sensory areas on tergites 3–4 are shown).

Variation. The paratypes have body length from 3.0 to 4.0 mm. The largest paratype also differs by having completely brown pronotal lobes and scutellum and postscutellum without reddish lateral stripes. In one male paratype gastral tergite 3 bears a pair of narrow latero-basal concavities, which are probably covered by the posterior margin of the preceding tergite in other specimens.

Remarks: The female of *P. applanatus* nov. spec. is very similar in body colouration to the female of *P. pulawskii* Antropov, 2001, from Mauritania, differing from it by the longer and translucent prominence of the medial lobe of clypeus, which is always curved downwards and flattened laterally, as well as by the comparatively denser silvery pubescence of the thorax. The female of *P. applanatus* nov. spec. is also similar to the female of *P. arabicus* nov. spec., but differs from it by the curved downwards and laterally flattened prominence of the medial lobe of clypeus and propodeal dorsum without black spot. Among all known males of the genus *Pseudomicroides* the new species is also similar to the male of *P. pulawskii*, from which it differs by the completely reddish medial lobe of clypeus without white markings, by the absence of white markings on lower frons, temples and hind femora and weaker white markings of all tibiae, by the shorter narrow yellowish stripes along inner eye orbits hardly reaching the middle of the eye height, by the shiny interspaces between punctures of upper frons, and also by the denser punctures of the posterior part of scutum, where they merge into wrinkles.

Distribution: United Arab Emirates.

Etymology: After *applanatus*, Latin for 'flattened', referring to the clypeal prominence.

Genus *Belomicroides* Kohl, 1899

Belomicroides maurusius Pate, 1931

Plates 29–33

Belomicroides maurusius Pate, 1931: 9 (Algeria); Antropov, 2002: 700 (Egypt).

Specimens examined: 1♂, Um al-Quwain, 25°32'N 55°32'E, leg. C. Schmid-Egger.

Remarks: This is the third collected male of the species representing the most eastern place of distribution of the genus *Belomicroides*. The female of *B. maurusius* is still unknown.

ACKNOWLEDGEMENTS

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Author's address:

A.V. Antropov, Zoological Museum of Moscow Lomonosov State University, Bol'shaya Nikitskaya str. 6, Moscow 125009, Russia; e-mail: antropov@zmmu.msu.ru

Annexes 1–4. Habitus photographs (by C. Schmid-Egger).



Annexes 1–2. *Pseudomicroides arabicus* nov. spec. 1: Male in lateral view; 2: Female in dorsal view.



Annexes 3–4. 3: *Pseudomicroides applanatus* nov. spec.; 4: *Belomicroides maurusius* Pate. Both in lateral view.

Order Hymenoptera, family Apidae

Tribe Allodapini, genus *Braunsapis*

Michael S. Engel & Holger H. Dathe

INTRODUCTION

The genus *Braunsapis* Michener, 1969, is the most diverse lineage of bees in the Old World tribe Allodapini, with 93 species recognized hitherto. The genus is found in Australia (Reyes, 1993), Africa and Madagascar (Michener, 1975a; Reyes, 1991b; Pauly et al., 2001), and the Oriental Region (Reyes, 1991a; Michener et al., 2003). Many of the species are difficult to distinguish on the basis of adults, while data from immatures and nesting biology tend to be more revealing (e.g. Michener, 1975c), a fact that appears widely across allodapines (e.g. Michener, 1975b, 1975c, 1975d, 1976; Chenoweth et al., 2008) and renders study of the group challenging. Herein we provide a brief taxonomic account of a new species of *Braunsapis* from the United Arab Emirates, and the first species of the genus for the broader Arabian fauna. This is of significance as the Arabian Peninsula is the point of intersection of the Ethiopian, Palaearctic, and Oriental biogeographic regions, the first and last of which have diverse allodapines populations. It is hoped that the formal recognition of this species might inspire the discovery of its nests and immature stages, as well as to more completely document its distribution on the Arabian Peninsula.

MATERIALS AND METHODS

The specimens recorded herein were referred to as *Braunsapis* aff. *mixta* in Dathe (2009). Morphological terminology generally follows that of Reyes (1991a), Engel (2001), and Michener (1975a, 2007), while the format for the descriptions is modeled after that of Reyes (1991a). Measurements were made using an ocular micrometer on an Olympus SZX-12 stereomicroscope. The specimens dealt with are divided between the Senckenberg Deutsches Entomologisches Institut (SDEI - Müncheberg, Germany), the Snow Entomological Collection, University of Kansas Natural History Museum (Lawrence, Kansas, USA), the UAE Invertebrate Collection and the collection of Jan Batelka (Prague, Czech Republic).

SYSTEMATIC ACCOUNT

Tribe **Allodapini** Cockerell, 1902

Subtribe **Allodapina** Cockerell, 1902

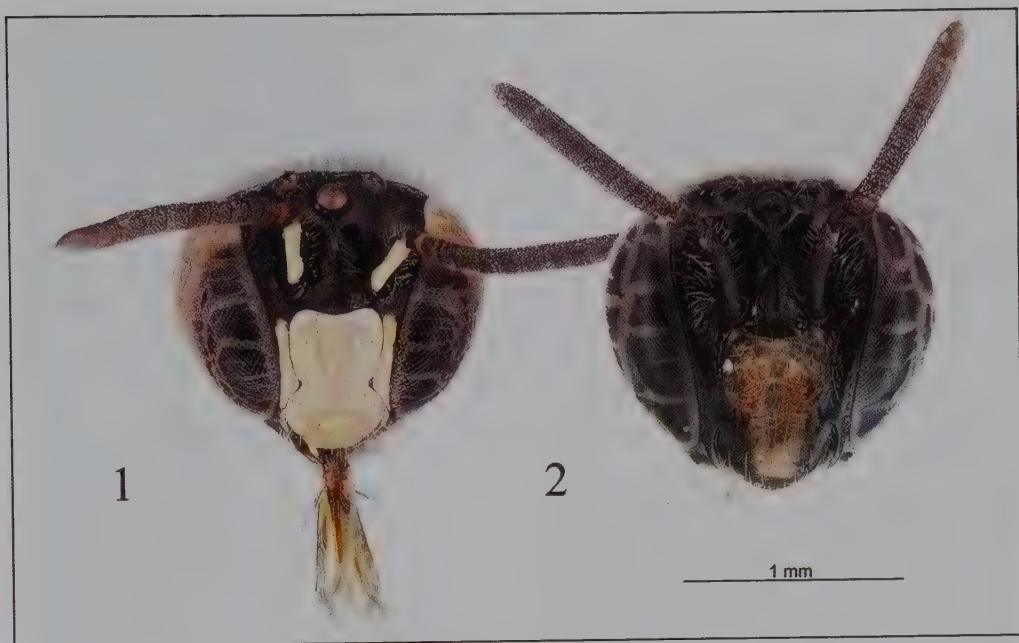
Genus ***Braunsapis*** Michener, 1969

***Braunsapis arabica* Engel & Dathe nov. spec.**

Plates 1–6

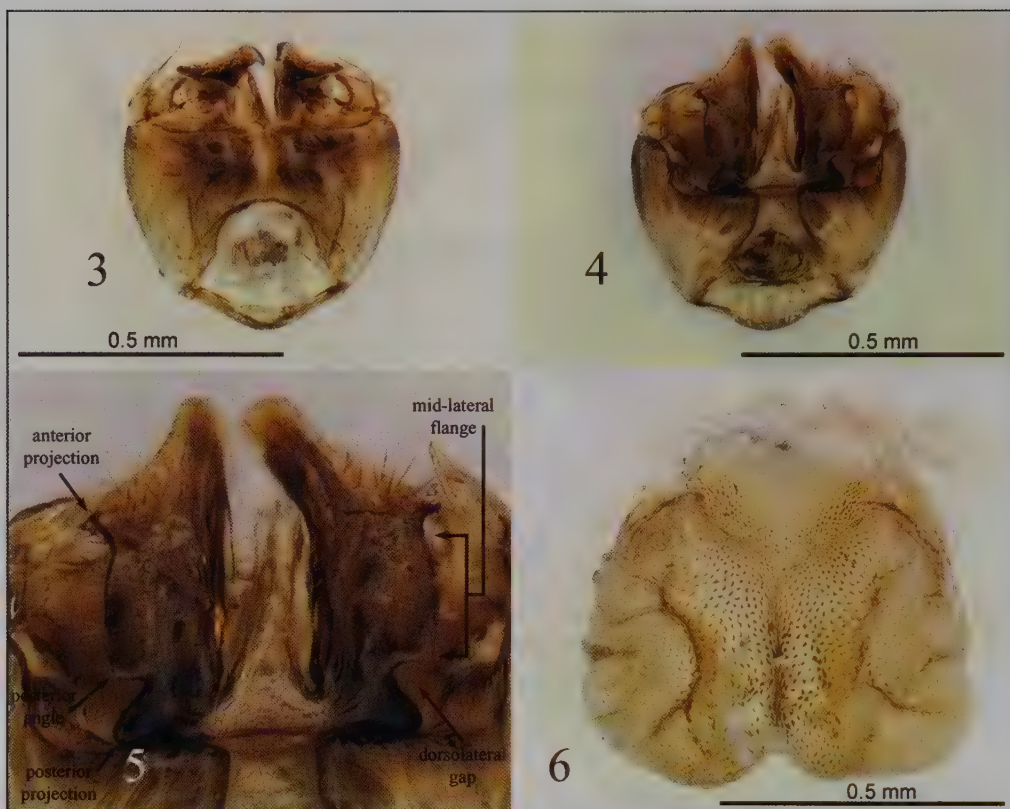
Braunsapis aff. *mixta*; Dathe, 2009: 408, 414 (Plates 116, 117).

Specimens examined: Holotype: ♂, "UAE [United Arab Emirates]: Sharjah, 25.21 N 55.24 E, 1–10.01.2005 [1–10 January 2005], light trap, T. van Harten leg." [SDEI]. Paratypes: 1♀, Fujairah, Wadi Hayl (see Plate 7), 225 m a.s.l., 28.iii.2007, leg. J. Batelka. 3♀, Sharjah, 28.vi–23.vi.2005, light trap, leg. A. van Harten. 1♀, Sharjah Desert Park, 30.iv–31.v.2008 light trap, leg. A. van Harten. 1♂, Um al Quwayn, 0 m, beach, 18.iii.2008, leg. M. Hauser.



Plates 1–2. Facial aspect of *Braunsapis arabica* Engel & Dathe nov. spec. 1: Holotype male; 2: Paratype female.

Diagnosis: The new species is similar to *B. mixta* (Smith, 1852) from Pakistan, India, and Sri Lanka, both species sharing many external features particularly in maculations. However, in the male genitalia the mediolateral flange of the penis valve is distinctly broader, with the apical dorsal width of the penis valve (as measured across the dorsal surface just basad the anterior projection) subequal to the basal dorsal width (as measured across the dorsal surface just apicad the dorsolateral gap), and resulting from a uniformly broad width of the mediolateral flange across its length. In *B. mixta* the mediolateral flange is narrow and tapers posteriorly such that the apical dorsal width of the penis valve is distinctly greater than the basal dorsal width (cf. Reyes, 1991). In addition, the posterior angle of the mediolateral flange of the penis valve is orthogonal and the dorsolateral gap is wide, about as wide as the mediolateral flange in the new species, while in *B. mixta* the posterior angle is distinctly obtuse and the dorsolateral gap has a length about twice as long as the mediolateral flange (vide Reyes, 1991). In these respects the penis valves resemble more those of *B. picitarsis* (Cameron, 1902), of roughly the same distribution as *B. mixta*, from which the new species can be immediately distinguished by longer dorsolateral gap (greatly narrowed in *B. picitarsis*), the prominent anterior projection (rather indistinct in *B. picitarsis*), and the acutely rounded gonostylar apex (more broadly rounded in *B. picitarsis*) (vide Reyes, 1991). While the head width/head length ratio for *B. arabica* (σ^7 1.14–1.16, ϕ 1.11–1.19) is generally within that of *B. mixta* (σ^7 1.14–1.19, ϕ 1.14–1.18 // vs. σ^7 1.09–1.14, ϕ 1.12–1.14 in *B. picitarsis*), the former seems to intermingle attributes of both species, with the metrics (Table 1) and maculations like those of *B. mixta*, but some genitalic features like that of *B. picitarsis*. In the key provided by Reyes (1991a), the new species will run to *B. mixta* but can be distinguished immediately by the aforementioned genitalic characters.



Plates 3–6. Male terminalia of *Braunsapis arabica* Engel & Dathe nov. spec. 3: Ventral aspect of genital capsule; 4: Dorsal aspect of genital capsule; 5: Detail of dorsal surfaces of penis valves; 6: Roof of genital chamber.

Description: Male. Total body length 4.43–4.48 mm; forewing length 2.97–3.02 mm ($n=2$). Head length 1.17, width 1.33–1.35 ($n=2$); head width/head length ratio 1.14–1.16. Facial markings as in Plate 1; labrum yellow; mandible black, with brown apex; clypeus entirely yellow; paraocular mark present; scape yellow on ventral surface. Pronotal lobe yellow; tegula transparent or lightly infumate, with medial yellow spot; axillary sclerites yellow. Metatrochanter and metafemur simple. Setae on metasomal terga IV–VI transparent; longer setae slanting to suberect, blunt to spiculate; shorter setae prostrate. Genitalia as in Plates 3–5; gonostylus tapering to acutely rounded and narrow apex, with one short seta laterally; ventroapical plate of gonocoxa with mesal process not greatly developed, asymmetrical, right plate with two peglike process on mesal process, left plate with three peglike processes on mesal process, lateral process strongly developed, distinctly extending beyond tangent of peglike setae, gently incurved; penis valve with distinct anterior projection, with mediolateral flange broad, not tapering in width, subequal in width across length, dorsolateral gap distinct, broad, gap about as long as mediolateral flange width; roof of genital chamber wrinkled, as depicted in Plate 6.

Female. Total body length 4.84–5.47 mm; forewing length 3.28–3.54 mm ($n=4$). Head length 1.20–1.23, width 1.33–1.47 ($n=4$); head width/head length ratio 1.11–1.19. Facial markings



Plate 7. The Wadi Hayl locality where a paratype female of *Braunsapis arabica* Engel & Dathe nov. spec. was captured by Jan Batelka (28 March 2007, photograph courtesy of J. Batelka).

as in Plate 2; labrum dark brown to black, sometimes with small apical brown to light brown spot; mandible black; malar space shorter than width of scape; clypeus partly black apicolaterally, markings generally like those of *B. mixta* (vide Reyes, 1991a) and narrowing apically to blunt apex (not acutely narrowed); paraocular mark absent; middle of epistomal sulcus slightly raised; scape without yellow markings ventrally, not reaching median ocellus. Pronotal lobe yellow; tegula transparent to lightly infumate; axillary sclerites yellow. Metabasitibial plate without distinct carina. Metasomal terga black to dark brown, imbricate; setae of metasomal terga IV–VI transparent, longer setae slanting, spiculate; shorter setae prostrate to subprostrate, spiculate; tergum VI rounded (not scoop-shaped).

Etymology: The specific epithet refers to the distribution of this species in the Arabian Peninsula.

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Table 1. Selected metrics for *Braunsapis* species considered herein (all values in millimetres except ratios, which are dimensionless).

Taxon	Total length	Head width	Head width /length ratio
Males			
<i>B. arabica</i> nov. spec.	4.4–4.5	1.33–1.35	1.14–1.16
<i>B. mixta</i> (Smith)	3.6–4.9	1.23–1.47	1.14–1.19
<i>B. picitarsis</i> (Cameron)	5.2–5.8	1.60–1.77	1.12–1.14
Females			
<i>B. arabica</i> nov. spec.	4.8–5.5	1.33–1.47	1.14–1.19
<i>B. mixta</i> (Smith)	3.8–6.1	1.23–1.57	1.14–1.18
<i>B. picitarsis</i> (Cameron)	5.8–7.7	1.53–1.80	1.09–1.14

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Authors' addresses:

Prof. Dr. Michael S. Engel, Division of Entomology (Paleoentomology), Natural History Museum, and Department of Ecology & Evolutionary Biology, 1501 Crestline Drive – Suite 140, University of Kansas, Lawrence, Kansas 66049-2811, United States; e-mail: msengel@ku.edu

Prof. Dr. Holger H. Dathe, Senckenberg Deutsches Entomologisches Institut, Eberswalder Straße 90, D-15374 Müncheberg, Deutschland; e-mail: Holger.Dathe@senckenberg.de

Order Diptera, family Ceratopogonidae

Ryszard Szadziewski, Marta Gwizdalska-Kentzer, Wojciech Gilka

INTRODUCTION

Biting midges (Ceratopogonidae) are a relatively well studied dipteran family that includes over 6 000 extant species in 110 genera (Borkent, 2009). They are present in nearly any semiaquatic and aquatic habitats in all regions of the world except Antarctica. Females usually require a protein-rich meal for maturation of the eggs. Species of *Leptoconops*, *Culicoides*, and the subgenus *Forcipomyia* (*Lasiohelea*) suck vertebrate blood, mainly of mammals and birds. Some *Atrichopogon* and *Forcipomyia* are ectoparasites on large insects or feed on dead insects or pollen. Females of many genera of the subfamily Ceratopogoninae are predaceous on small insects or even on their own males. Both sexes of biting midges may visit flowers with easily accessible nectar. Species of the genus *Dasyhelea* are exclusively flower visiting and feeding on nectar. Most biting midges are crepuscular but *Leptoconops* and a few others fly in full sunshine. Immature stages of most Ceratopogoninae are aquatic or semiaquatic and inhabit mud or wet soil on lake, pond, stream and river margins, salt marshes, tree holes, water holding plants, etc. Larvae of most *Forcipomyia* species are terrestrial and live under rotting bark of trees, among mosses and similar habitats. Larvae of *Leptoconops* burrow in sand or soil, mainly of arid areas and on coastal and inland beaches.

Biting midges of the Arabian Peninsula are relatively poorly studied. From this region only about 100 species were reported by Clastrier & Boorman (1987), Boorman (1989, 1990), Boorman & van Harten (2002) and Szadziewski et al. (2009). The following genera (in parentheses number of species) were recorded in the Arabian Peninsula: *Alluaudomyia* (4), *Atrichopogon* (5), *Bezzia* (5), *Brachypogon* (3), *Culicoides* (37), *Dasyhelea* (16), *Forcipomyia* (10), *Homoelelea* (1), *Leptoconops* (4), *Nilobezzia* (1), *Palpomyia* (5), *Phaenobezzia* (1), *Serromyia* (1), *Stilobezzia* (2). From the United Arab Emirates only *Leptoconops mellori* Clastrier & Boorman, 1987, *Culicoides azerbaijdzhanicus* Dzhabarov, 1962, *Culicoides rarus* de Meillon, 1936, *Culicoides wardi* Boorman & van Harten, 2002, *Dasyhelea deemingi* Boorman & van Harten, 2002, *Forcipomyia psilonota* Kieffer, 1911, and *Dasyhelea fasciigera* Kieffer, 1924, were recorded by Boorman (1989) and Boorman & van Harten (2002).

In a small collection of biting midges examined we determined 44 species in 11 genera. Among them eight new species in the genera *Allohelea*, *Atrichopogon*, *Brachypogon*, *Dasyhelea*, *Forcipomyia* and *Serromyia* are described and illustrated and for *Stilobezzia harurii* Boorman & van Harten, 2002, and *Palpomyia ebejeri* Boorman & van Harten, 2002, unknown females are described for the first time. *Forcipomyia mursafae* Ghonaim et al., 2001, is recognized as a junior synonym of *F. pulcherrima* Santos Abreu, 1918.

MATERIALS AND METHODS

Biting midges were collected in the UAE at light and by Malaise traps in 2005–2009. Unless otherwise stated the specimens were collected by Antonius van Harten. For exact data on sampling sites and methods see van Harten (2008). Most specimens are mounted on microscope slides in a mixture of Canada balsam and phenol. They are housed in the collection of the Department of Invertebrate Zoology, University of Gdańsk and in the United Arab Emirates Invertebrate Collection.

Abbreviations used: LT = light trap; MT = Malaise trap.

SYSTEMATIC ACCOUNT

Subfamily **Leptoconopinae** Noè, 1907

Genus ***Leptoconops*** Skuse, 1889

Subgenus ***Holoconops*** Kieffer, 1918

Leptoconops kerteszi Kieffer, 1908

Specimens examined: Al-Ajban, 2♂, 1♀, 30.i–26.ii.2006, MT. Hatta, 1♂, 14–21.vi.2008, LT. Sharjah Desert Park, 2♂, 2♀, 11.xii.2008–2.ii.2009, LT; 3♂, 9–21.iii.2005, LT; 1♂, 20.x–8.xi.2005, LT; 1♀, 9.viii–6.ix.2008, LT. Sharjah-Khor Kalba, near tunnel, 2♂, 1♀, 26.iv–3.v.2006, LT. Wadi Bih dam, 1♂, 22–29.iii.2007, LT; 3♂, 1♀, 1–6.iii.2008, LT; 1♂, 13–20.v.2008, LT. Wadi Safad, 4♂, 26.iv–4.v.2006, LT.

Distribution: Widely distributed in the Mediterranean region and Arabian Peninsula (Gutsevich, 1997; Boorman & van Harten, 2002). Reported for the first time from the UAE.

Subgenus ***Proleptoconops*** Clastrier, 1974

Leptoconops aviarum Gutsevich, 1973

Specimens examined: Bithnah, 1♀, 4–26.iii.2006, LT. Wadi Madaq, 2♀, 6–13.v.2006, LT.

Comments: Anterior anepisternum with two long setae on distal margin is similar to that found in males of *L. bahreinensis*. It is possible that females of *L. aviarum* and males *L. bahreinensis* represent the same species.

Distribution: Tadzhikistan, Algeria. Reported for the first time from the UAE.

Leptoconops bahreinensis Clastrier & Boorman, 1987

Specimens examined: Wadi Safad, 1♂, 26.iv–4.v.2006, LT.

Comments: The species is known from males only. Anterior anepisternum with two long setae on caudal margin is similar to that found in females of *L. aviarum*. Genitalia as described by Clastrier & Boorman (1987).

Distribution: Bahrain. Reported for the first time from the UAE.

Subfamily **Forcipomyiinae** Lenz, 1934

Genus ***Atrichopogon*** Kieffer, 1906

Subgenus ***Atrichopogon*** Kieffer, 1906

Atrichopogon arabicus Szadziwski, Gwizdalska-Kentzer & Gilka **nov. spec.** Figure 1
Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Wurayah farm [25°24'N 56°20'E], 15.i–2.ii.2009, light trap, leg. A. van Harten. Paratypes: 3♂, Hatta, 4–11.iv.2006, light trap, leg. A. van Harten. Types are deposited in the Department of Invertebrate Zoology, University of Gdańsk.

Description: Female unknown. Male: Body dark brown, abdomen and legs pale. Eyes pubescent. Palpus 5-segmented; third palpal segment with small sensory pit on apical third. Flagellum with 13 flagellomeres, 2–8 fused, 9–13 elongated; AR 0.92–0.97; length 0.30–0.32 mm. Paratergite bearing one seta. Anterior anepisternum B-shaped. Scutellum with only two submedian bristles. Wing length 0.80–0.95 mm, CR 0.45–0.55, membrane without macrotrichia. First radial cell greatly reduced, linear, second one well developed. TR of fore leg 3.3, mid leg 3.5, of hind leg 2.6. Genitalia as in Figure 1. Sternite 9 with straight caudal

margin, bearing some strong setae. Tergite 9 with evenly rounded apex. Gonocoxite slender. Gonostylus slender, tapering to slightly curved apical third. Aedeagus triangular, with low basal arch, apex with broad median lobe and two lateral projections.

Diagnosis: Similar to Afrotropical *A. chrysosphaerotum* Ingram & Macfie, 1921. Differs in having pubescent eyes and aedeagus with low basal arch and bearing more distinct apical median lobe and two lateral projections.

Distribution: UAE.

Genus *Forcipomyia* Meigen, 1818

Subgenus *Euprojoannisia* Brèthes, 1914

Forcipomyia psilonota (Kieffer, 1911)

Specimens examined: Hatta, 1♂, 30.i–26.ii.2006, LT. Sharjah, 1♂, 1–31.i.2005, LT. Sharjah Desert Park, 4♂, 25.i–9.iii.2005, 9.viii–6.ix.2008, LT. Wadi Bih dam, 3♂, 25.ii–8.iii.2009, MT.

Distribution: Widespread Afrotropical species reported from whole Africa, Oriental region and Arabian Peninsula. Reported from the UAE by Boorman & van Harten (2002).

Subgenus *Lasiohelea* Kieffer, 1921

Forcipomyia baltea Boorman, 1990

Specimens examined: Bithnah, 2♂, 4–26.iii.2006, LT. Hatta, 1♂, 30.i–26.ii.2006, LT. Sharjah Desert Park, 1♂, 9.viii–6.ix.2008, LT. Wadi Safad, 2♂, 26.iv–4.v.2006, LT.

Distribution: Oman (Boorman, 1990). Reported for the first time from the UAE.

Subgenus *Lepidohelea* Kieffer, 1917

Forcipomyia pulcherrima Santos Abreu, 1918

Forcipomyia marsafae Ghonaim, Ibrahim & Ali, 2001: 42 (male, female, Egypt). **Nov. syn.**

Specimens examined: Al-Ajban, 3♂, 30.i–26.ii.2006, MT. Bithnah, 2♂, 4–26.iii.2006, LT. Sharjah, 1♂, 1–31.i.2005, LT. Sharjah Desert Park, 1♂, 9–21.iii.2005, LT; 2♂, 27.xi–11.xii.2008, LT. Wadi Bih dam, 3♂, 25.ii–29.iii.2007, LT. Wadi Wurayah farm, 3♂, 22.ii–15.iii.2009, LT.

Discussion: *F. marsafae* described from Egypt does not differ from *F. pulcherrima* now examined. Characters shown as diagnostic by Ghonaim et al. (2001): Tibia and first tarsomere with long bristles, more hairy wing and less expanded tip of gonostylus, we found as infraspecific variation depending also on the state of preservation of specimens. As a result we propose to place *F. marsafae* in the list of junior synonyms of well-known and broadly distributed *F. pulcherrima*.

Distribution: Widely distributed in the Afrotropical, southern Palaearctic (incl. Japan) and Oriental regions. Reported for the first time from the UAE.

Subgenus *Pedilohelea* De Meillon & Wirth, 1980

Forcipomyia eremita Szadziewski, Gwizdalska-Kentzer & Giłka **nov. spec.** Figures 2–5

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Wurayah farm [25°24'N 56°20'E], 15.i–22.ii.2009, light trap, leg. A. van Harten. Paratypes: 2♂, same data as the holotype. The holotype and paratypes are deposited in the collection of the Department of Invertebrate Zoology, University of Gdańsk, Poland.

Description: Female unknown. Male: Eyes bare. Flagellum 0.75–0.85 mm, distal 4 flagellomeres elongate, AR 0.76–0.82. 4th and 5th palpal segments completely fused; third

palpal segment 0.076–0.084 mm long, almost cylindrical, with a group of few long capitate setae on surface of basal third (Fig. 2). Wing length 1.09–1.14 mm, CR 0.32–0.38. TR(I) 0.7–0.8, TR(II) 0.4–0.5, TR(III) 0.5–0.6. Genitalia as in Figure 3. Gonocoxite long and slender. Gonostylus sharply slender on distal half. Aedeagus (Fig. 4) long, with evenly rounded apex armed with sharp apical projection; basal arms long. Parameres U-shaped, heavily sclerotized, each arm with ventral triangular expansion at mid length (Fig. 5).

Diagnosis: Males of the new species are characteristic in having parameres U-shaped, each arm with ventral triangular expansion at mid length, aedeagus with simple rounded apex armed with sharp apical projection. Similar to *F. draconis* De Meillon & Wirth, 1980, from South Africa (De Meillon & Wirth, 1980), possibly its sister species. In *F. draconis* apex of aedeagus is trilobed, parameres joined basally for longer distance and each paramere with ventral triangular expansion on basal third.

Distribution: UAE.

Subgenus *Synthyridomyia* Saunders, 1957

***Forcipomyia murina* (Winnertz, 1852)**

Specimens examined: Al-Ajban, 1♂, 21–28.xii.2005, LT. SSW of ad-Dhaid, 1♂, 10–15.xii.2005, LT. Fujairah, 1♂, 16–24.iii.2005, LT. Hatta, 2♂, 30.i–26.ii.2006, LT; 1♂, 4–11.iv.2006, LT. Sharjah Desert Park, 6♂, 25.i–22.ii.2005, LT. Wadi Bih dam, 1♂, 1–15.iii.2007, LT; 2♂, 25.ii–8.iii.2009, MT.

Distribution: Widely spread in the Holarctic and Afrotropical regions. Reported for the first time from the UAE.

Subgenus *Thyridomyia* Saunders, 1925

***Forcipomyia litoraurea* (Ingram & Macfie, 1924)**

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT; 1♂, 21.viii–19.ix.2006, MT. Sharjah Desert Park, 1♂, 30.iv–25.v.2005, LT; 1♂, 27.xi–11.xii.2008, LT; 2♂, 11.xii.2008–6.i.2009, LT; 1♂, 12.i–2.ii.2009, LT.

Distribution: Widespread in whole Africa and Western Palaearctic. Reported for the first time from the UAE.

***Forcipomyia frutetorum* (Winnertz, 1852)**

Specimens examined: Hatta, 2♂, 4–11.iv.2006, LT. Sharjah Desert Park, 1♂, 12.i–2.ii.2009, LT. Wadi Bih dam, 1♂, 1–15.iii.2007, LT; 4♂, 25.ii–8.iii.2009, MT.

Distribution: Widespread in the Holarctic and Afrotropical regions. Reported for the first time from the UAE.

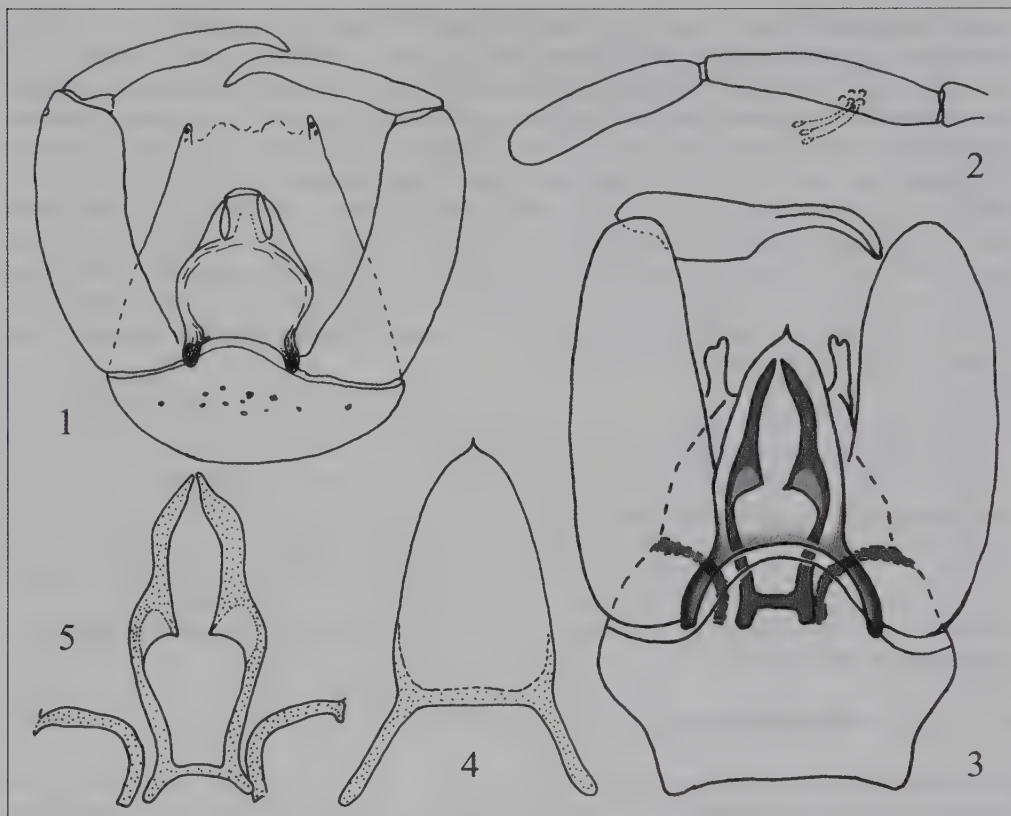
Subfamily **Dasyheleinae** Lenz, 1934

Genus ***Dasyhelea*** Kieffer, 1911

Subgenus ***Dasyhelea*** Kieffer, 1911

***Dasyhelea kruppi* Boorman & van Harten, 2002**

Specimens examined: Fujairah, 3♂, 27.v–17.vi.2006, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 26.iv–3.vi.2006, LT.



Figures 1–5. Males of *Atrichopogon arabicus* nov. spec. (1) and *Forcipomyia eremita* nov. spec. (2–5). 1, 3: Genitalia, 2: Palpus, 4: Aedeagus, 5: Parameres.

Distribution: Oman (Boorman & van Harten, 2002). Reported for the first time from the UAE.

***Dasyhelea tibestiensis* Clastrier, Rioux & Descous, 1961**

Specimens examined: Al-Ajban, 5♂, 30.i–26.ii.2006, MT. Fujairah, 2♂, 27.v–17.vi.2006, LT. Hatta, 2♂, 30.i–26.ii.2006, 14–21.vi.2008, LT. Sharjah Desert Park, 1♂, 27.x–11.xii.2008, LT; 1♀, 1–30.xi.2008, LT; 1♂, 11.xii.2008–6.i.2009, LT; 1♂, 1♀, 12.i–2.ii.2009, LT. Wadi Safad, 3♂, 26.iv–4.v.2006, LT. Wadi Wurayah farm, 1♂, 22.ii–2.iii.2009, LT.

Distribution: Chad (Clastrier, Rioux & Descous, 1961), Oman, Yemen (Boorman & van Harten, 2002). Reported for the first time from the UAE.

Subgenus ***Dicryptoscena* Enderlein, 1936**

***Dasyhelea biannulata* Clastrier, Rioux & Descous, 1961**

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT. Sharjah Desert Park, 1♂, 15.xii.2008–12.i.2009, LT; 2♂, 12.i–2.ii.2009, LT. Wadi Safad, 1♂, 26.iv–4.v.2006, LT. Wadi Bih dam, 1♂, 1–6.iii.2008, LT.

Distribution: Chad (Clastrier, Rioux & Descous, 1961), Yemen (Boorman & van Harten, 2002). Reported for the first time from the UAE.

Dasyhelea desertorum Szadziewski, Gwizdalska-Kentzer & Gilka **nov. spec.** Figures 6–9
Specimens examined: Holotype: ♂, United Arab Emirates, Hatta [24°49'N 56°07'E], 4–11.iv.2006, light trap, leg. A. van Harten. The holotype is deposited in the collection of the Department of Invertebrate Zoology, University of Gdańsk, Poland.

Description: Thorax brownish with yellow humeri and scutellum, abdomen and legs yellowish. Flagellum 0.376 mm long. Last flagellomere with rounded apex. Palpus 5-segmented. Wing pale, length 0.60 mm, CR 0.29. First radial cell present, linear. TR(I) 2.0, TR(II) 2.2, TR(III) 2.0. Male genitalia as in Figure 6. Sternite IX with two long caudosubmedian processes (Fig. 7). Tergite IX with rounded apex, without apicolateral processes. Gonocoxite without special armature. Gonostylus evenly curved. Aedeagus well sclerotized, H-shaped (Fig. 8). Parameres composed of two basal arms and single long and curved medial process (Fig. 9).

Diagnosis: The species is characteristic in having unique male genitalia with sternite IX bearing two long submedian projections on caudal margin.

Distribution: UAE.

Subgenus *Pseudoculicoides* Malloch, 1915

Dasyhelea arenivaga Macfie, 1943

Specimens examined: Sharjah Desert Park, 1♂, 9.viii–6.ix.2008, LT.

Distribution: Poland, Czech Republic, Switzerland, Romania, Ukraine (Crimea), Bulgaria, Spain, Algeria, Egypt, Israel. Reported for the first time from the UAE.

Dasyhelea deemingi Boorman & van Harten, 2002

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT. SSW of ad-Dhaid, 2♂, 10–15.xii.2005, LT. Sharjah Desert Park, 4♂, 11.xii.2008–6.i.2009, LT. Wadi Bih dam, 1♂, 25.ii–8.iii.2009, MT. Wadi Madaq, 1♂, 27.xi–23.xii.2005, LT. Wadi Safad, 1♂, 26.iv–4.v.2006, LT. Wadi Wurayah farm, 2♂, 15.i–22.ii.2009, LT.

Comments: *Dasyhelea deemingi* from the Arabian Peninsula and *D. labinoda* Mazumdar & Chaudhuri, 2009, from India have identical male genitalia. The morphology of genitalia described by the Indian authors (Mazumdar & Chaudhuri, 2009) and presented in figs 3a–h (l.c.), is wrongly illustrated and interpreted (male paratype examined). It seems that these names are conspecific, and *D. labinoda* will probably be recognized as a junior synonym in the future.

Distribution: Bahrain, Dubai, Oman, Saudi Arabia (Boorman & van Harten, 2002). Reported for the first time from the UAE.

Dasyhelea egypti Macfie, 1943

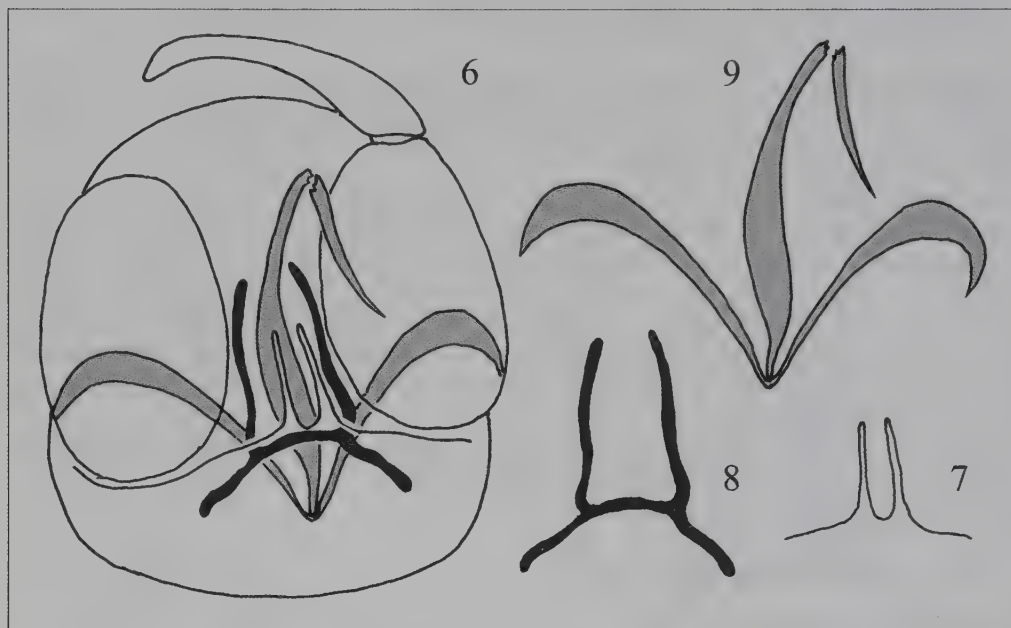
Specimens examined: Al-Ajban, 2♂, 30.i–26.ii.2006, MT; 7♂, 21.viii–19.ix.2006, MT. Hatta, 2♂, 30.i–11.iv.2006, LT. Sharjah Desert Park, 1♂, 30.vi–21.vii.2005, LT; 1♂, 9.viii–6.ix.2008, LT; 3♂, 12.i–2.ii.2009, LT. Wadi Safad, 1♂, 26.iv–4.v.2006, LT.

Distribution: Egypt. Reported for the first time from the UAE.

Dasyhelea eremita Remm & Nazarmukhamedov, 1969

Specimens examined: Al-Ajban, 3♂, 21.viii–19.ix.2006, MT.

Distribution: Tajikistan. Reported for the first time from the UAE.



Figures 6–9. *Dasyhelea desertorum* nov. spec., male. 6: Genitalia; 7: Projections of sternite IX; 8: Aedeagus; 9: Parameres.

***Dasyhelea fasciigera* Kieffer, 1925**

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT. Bithnah, 1♂, 4–26.iii.2006, LT. Hatta, 1♂, 4–11.iv.2006, LT. Sharjah Desert Park, 2♂, 9.viii–6.ix.2008, LT; 4♂, 15.xii.2008–2.ii.2009, LT. Sharjah–Khor Kalba, near tunnel, 2♂, 26.iv–3.v.2006, LT. Wadi Bih dam, 2♂, 25.ii–8.iii.2009, MT. Wadi Safad, 2♂, 26.iv–4.v.2006, LT. Wadi Wurayah farm, 1♂, 15.i–22.ii.2009, LT; 2♂, 22.ii–2.iii.2009, LT.

Distribution: Widely spread in the Holarctic region. Reported from the UAE by Boorman & van Harten (2002).

***Dasyhelea fosteri* Clastrier, 1983**

Specimens examined: Hatta, 1♂, 4–11.iv.2006, LT. Sharjah Desert Park, 1♂, 15.xii.2008–12.i.2009, LT.

Distribution: Seychelles (France). Reported for the first time from the UAE.

***Dasyhelea ismailiae* Macfie, 1943**

Specimens examined: Sharjah Desert Park, 2♂, 12.i–2.ii.2009, LT. Wadi Bih dam, 1♂, 22–29.iii.2007, LT.

Distribution: Egypt, Arabian Peninsula, South Africa. Reported for the first time from the UAE.

***Dasyhelea noctuabunda* Remm, 1980**

Specimens examined: Hatta, 2♂, 4–11.iv.2006, LT. Sharjah–Khor Kalba, near tunnel, 1♂, 26.iv–3.v.2006, LT. Wadi Bih dam, 1♂, 13–20.v.2008, LT.

Distribution: Tajikistan. Reported for the first time from the UAE.

***Dasyhelea sternalis* Remm, 1980**

Specimens examined: Fujairah, 1♂, 27.v–3.vi.2006, LT. Hatta, 1♂, 30.i–26.ii.2006, LT. Wadi Bih dam, 1♂, 22–29.iii.2007, LT.

Distribution: Tajikistan (Remm, 1980), Oman, Yemen (Boorman & van Harten, 2002). Reported for the first time from the UAE.

Subgenus ***Prokempia*** Kieffer, 1913

***Dasyhelea flava* Carter, Ingram & Macfie, 1921**

Specimens examined: Wadi Safad, 3♂, 26.iv–4.v.2005, LT.

Distribution: Widely distributed Afrotropical species. Reported for the first time from the UAE.

***Dasyhelea flaviformis* Carter, Ingram & Macfie, 1921**

Specimens examined: Bithnah, 1♂, 4–26.iii.2006, LT. Fujairah, 1♂, 27.v–3.vi.2006, LT. Hatta, 1♂, 4–11.iv.2006, LT.

Distribution: Afrotropical species. Reported for the first time from the UAE.

Subgenus ***Sebessia*** Remm, 1979

***Dasyhelea latiforceps* Clastrier, 1983**

Specimens examined: Bithnah, 1♂, 4–26.iii.2006, LT. Hatta, 3♂, 30.i–11.iv.2006, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 26.iv.2006–3.v.2006, LT. Wadi Bih dam, 1♂, 22–20.iii.2007, LT.

Distribution: Seychelles. Reported for the first time from the UAE.

Subfamily ***Ceratopogoninae*** Newman, 1834

Tribe ***Culicoidini*** Kieffer, 1911

Genus ***Culicoides*** Latreille, 1809

***Culicoides arabiensis* Boorman, 1989**

Specimens examined: Wadi Bih dam, 1♂, 22–29.iii.2007, LT.

Distribution: Oman (Boorman, 1989). Reported for the first time from the UAE.

***Culicoides azerbaijdzhanicus* Dzhafarov, 1962**

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT. Hatta, 1♂, 4–11.iv.2006, LT. Sharjah Desert Park, 1♂, 27.xi–11.xii.2008, LT; 6♀, 11.xii.2008–6.i.2009, LT.

Distribution: North Africa, Arabian Peninsula, Middle East, Central Asia. Reported from the UAE by Boorman (1989).

***Culicoides badooshensis* Khalaf, 1961**

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT. Sharjah Desert Park, 2♂, 25.i–22.ii.2005, LT; 1♂, 1–30.11.2008, LT; 2♂, 1♀, 12.i–2.ii.2009, LT.

Distribution: Iraq, Oman. Reported for the first time from the UAE.

***Culicoides buettikeri* Boorman, 1989**

Specimen examined: Sharjah Desert Park, 1♀, 11.xii.2008–6.i.2009, LT.

Distribution: Oman. Reported for the first time from the UAE.

***Culicoides imicola* Kieffer, 1913**

Specimens examined: Al-Ajban, 2♀, 30.i–26.ii.2006, MT; 1♀, 21.viii–19.ix.2006, MT. Bithnah, 1♀, 4–26.iii.2006, LT. Hatta, 2♀, 30.i–26.ii.2006, LT; 1♀, 14–21.vi.2006, LT. Sharjah Desert Park, 1♂, 21.vii–5.viii.2005, LT; 1♂, 1♀, 9.viii–6.ix.2008, LT; 1♀, 1–30.xi.2008, LT; 1♂, 27.xi–11.xii.2008, LT; 1♀, 12.i–2.ii.2009, LT. Sharjah-Khor Kalba, near tunnel, 1♀, 26.iv–3.v.2006, LT. Wadi Bih dam, 1♂, 1–6.iii.2008, LT. Wadi Wurayah farm, 1♂, 15.i–22.ii.2009, LT.

Distribution: Widely distributed in Africa, Arabian Peninsula, Mediterranean region, India. Reported from the UAE by Boorman (1989).

***Culicoides kingi* Austen, 1912**

Specimens examined: Al-Ajban, 1♂, 2♀, 30.i–26.ii.2006, MT; 1♀, 2–9.iv.2006, LT. Fujairah, 1♂, 6♀, 27.v–3.vi.2006, LT; 1♂, 6♀, 10–17.vi.2006, LT. Sharjah Desert Park, 2♀, 9.viii–6.ix.2008, LT; 1♂, 1♀, 27.xi–11.xii.2008, LT; 1♀, 11.xii.2008–6.i.2009, LT; 1♂, 4♀, 12.i–2.ii.2009, LT. Sharjah-Khor Kalba, near tunnel, 2♀, 26.iv–3.v.2006, LT. Wadi Bih dam, 1♀, 1–6.iii.2008, LT. Wadi Safad, 1♂, 1♀, 26.iv–4.v.2006, LT.

Distribution: Africa, Arabian Peninsula. Reported for the first time from the UAE.

***Culicoides mesghalii* Navai, 1973**

Specimens examined: Sharjah Desert Park, 2♀, 27.xi–11.xii.2008, LT; 1♀, 11.xii.2008–6.i.2009, LT. Wadi Bih dam, 1♀, 1–15.iii.2007, LT; 3♂, 22–29.iii.2007, LT; 1♀, 13–20.v.2008, LT. Wadi Safad, 1♂, 1♀, 26.iv–4.v.2006, LT.

Distribution: Iran, Egypt, Arabian Peninsula. Reported for the first time from the UAE.

***Culicoides odiatus* Austen, 1921**

Specimens examined: Al-Ajban, 1♀, 30.i–26.ii.2006, MT. Sharjah Desert Park, 1♂, 12.i–2.ii.2009, LT.

Distribution: Central Asia, Caucasus, Ukraine, Middle East, Arabian Peninsula. Reported for the first time from the UAE.

Tribe *Ceratopogonini* Newman, 1834**Genus *Allohelea* Kieffer, 1917*****Allohelea vespertilio* Szadziewski, Gwizdalska-Kentzer & Giłka nov. spec.**

Plates 1–2, Figures 10–13

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Wurayah farm [25°24'N 56°20'E], 15.i–22.ii.2009, light trap, leg. A. van Harten. The holotype is housed in the Department of Invertebrate Zoology, University of Gdańsk.

Description: Female unknown. Male. Body brown, scutellum and legs brownish with hind femur darker in apical part (Plate 1). Palpus 5-segmented, yellowish, fifth palpal segment dark; third palpal segment with small sensory pit at apex; fourth palpal segment with one seta. Flagellum 0.727 mm long, all flagellomeres well separated, ultimate flagellomere with long apical projection armed with one seta. Scutellum with two submedian and two lateral bristles. Wing length 1.30 mm, CR 0.68. Wing membrane without marking pattern, only with slightly darkened veins M1, M2 and Cu. Both first radial cells well developed. Femur and tibia of hind leg stout. Claws of fore and mid leg short, equal, each with basal tooth. Hind leg with single long claw (Plate 2). TR(I) 2.5, TR(II) 2.8, TR(III) 2.4. Genitalia as in Figure 10. Apex of tergite IX narrow with strong horn-like apicolateral processes (Fig. 11). Gonocoxite with long ventromedian process at mid length. Gonostylus strongly curved, with widened subapical portion. Aedeagus composed of two pieces; distal piece long and narrow, with two



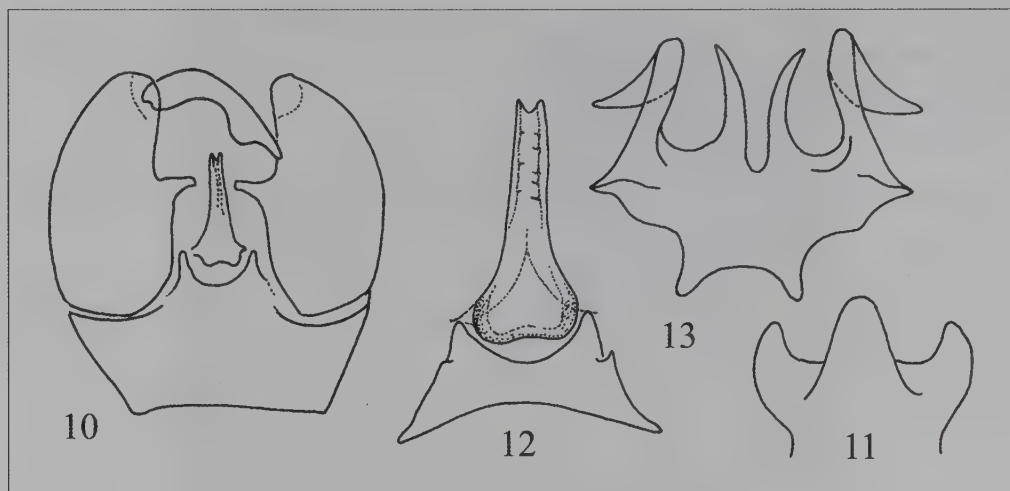
Plates 1–2. *Allohelea vespertilio* nov. spec., male. 1: Thorax in lateral aspect, 2: Tarsus of hind leg,

rows of ventral spines (Fig. 12). Parameres broad, with two strong submedian and two curved stout apicolateral arms (Fig. 13).

Diagnosis: Males of the new species can be easily distinguished by having wings without marking pattern, gonostylus subapically expanded and apicolateral arms of parameres strongly sclerotized, pointed and sharply curved, and gonocoxite with distinct ventral extension at mid length. Most similar to *A. pallifemorata* (Remm, 1980) from Tadjikistan, which probably is a sister species (see Remm, 1980; Clastrier & Delecolle, 1990).

Distribution: United Arab Emirates.

Etymology: The specific name refers to parameres which resemble a bat (Latin *vespertilio*).



Figures 10–13. *Allohelea vespertilio* nov. spec., male. 10: Genitalia; 11: Apex of tergite IX; 12: Aedeagus; 13: Parameres.

Genus *Brachypogon* Kieffer, 1899

Subgenus *Brachypogon* Kieffer, 1899

Brachypogon arabicus Szadziewski, Gwizdalska-Kentzer & Gilka nov. spec.

Figures 14–17

Specimens examined: Holotype: ♂, United Arab Emirates, Hatta [24°49'N 56°07'E], 4–11.iv.2006, light trap, leg. A. van Harten. The holotype is housed in the Department of Invertebrate Zoology, University of Gdańsk.

Description: Female unknown. Male. Body brown, with paler legs. Palpus 5-segmented, third palpal segment with sensory pit at apex (Fig. 14). Fourth palpal segment with one seta. Flagellum 0.37 mm long, composed of 9 flagellomeres. Flagellomeres 2–7 fused. Katepisternum with single seta. Scutellum with two submedian and two lateral setae. Wing length 0.54 mm, CR 0.33. Wing membrane pale, transparent. Both radial cells reduced. Median veins invisible. First tarsomere of hind leg with simple spine-like palisade setae. Tibial comb composed of 7 spines, tibial spur short. Tarsus of hind leg elongated, femur slightly enlarged. TR(I) 1.6, TR(II) 1.2, TR(III) 1.6. Genitalia as in Figure 15. Sternite IX short with straight caudal margin. Tergite IX with two short and blunt apicolateral processes. Gonocoxite without special armature. Gonostylus slender, curved, tapering to pointed apex. Aedeagus shield-shaped, with rounded apex; basal arch low (Fig. 16). Parameres fused, with long basal arms (Fig. 17).

Diagnosis: The species can be easily separated from other species of the genus by having nine flagellomeres, the slender gonostylus and shield-shaped aedeagus (see Grogan & De Meillon, 1993).

Distribution: United Arab Emirates.

Brachypogon obesus Szadziwski, Gwizdalska-Kentzer & Gilka **nov. spec.** Figure 18
Specimens examined: Holotype: ♂, United Arab Emirates, Hatta [24°49'N 56°07'E], 4–11.iv.2006, light trap, leg. A. van Harten. The holotype is housed in the Department of Invertebrate Zoology, University of Gdańsk.

Description: Female unknown. Male. Body dark brown. Legs brownish with more pale tarsi. Palpus 5-segmented, third palpal segment with sensory pit at apex. Fourth palpal segment with one seta. Flagellum missing. Katepisternum with single seta. Scutellum with two submedian and two lateral setae. Wing membrane extremely pale, transparent. Both radial cells reduced. Median veins invisible. First tarsomere of hind leg with simple spine-like palisade setae. Tibial comb composed of 8 spines, tibial spur short. Tarsus of hind leg elongated, femur slightly enlarged. Genitalia as in Figure 18. Sternite IX moderately long, with weak caudomedian excavation. Apical portion of tergite IX narrow, with broad blunt apicolateral processes armed with single seta each. Gonocoxite robust. Gonostylus short, triangular, slightly curved and apically pointed. Aedeagus long and slender, with simple apex; basal arch low. Parameres indistinct, barely visible.

Diagnosis: The species is characteristic within other species of the genus in the following combination of features: gonostylus short and stout, aedeagus slender triangular with simple apex (see Grogan & De Meillon, 1993).

Distribution: United Arab Emirates.

Etymology: Specific name refers to stout (Latin *obesus*) gonocoxites in male genitalia.

Subgenus *Isohelea* Kieffer, 1899

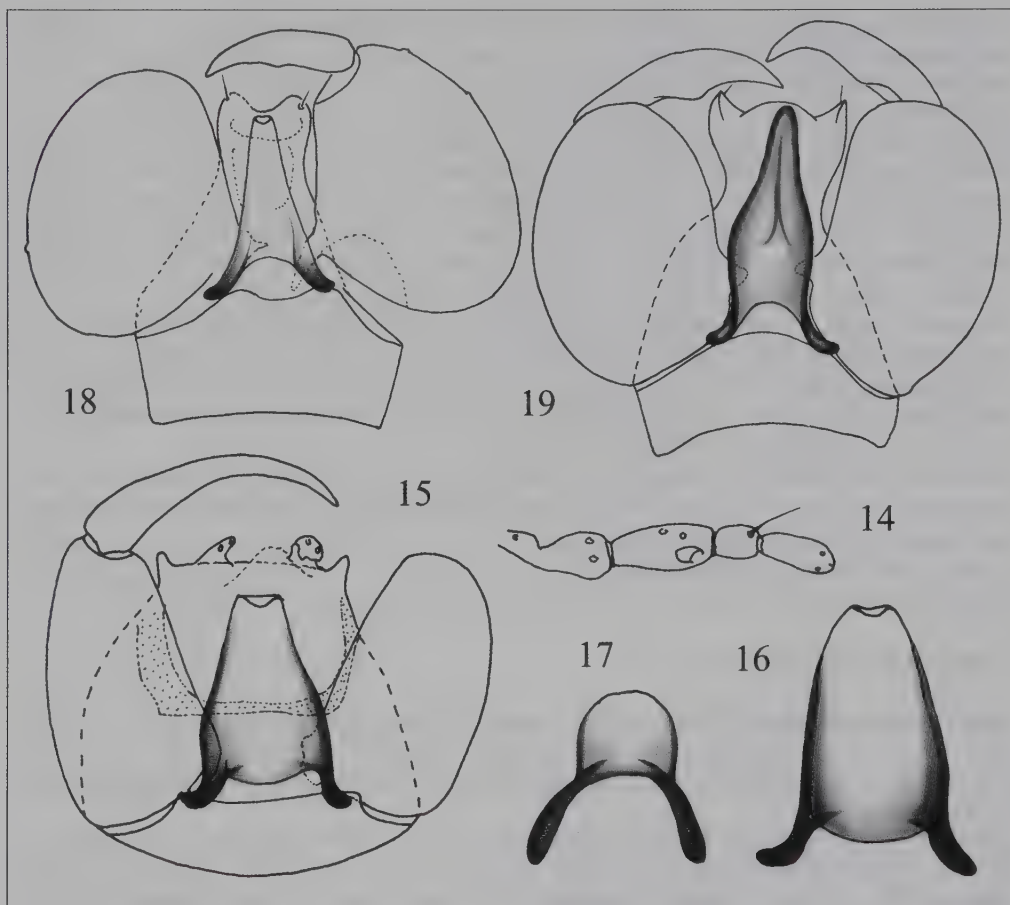
Brachypogon vanharteni Szadziwski, Gwizdalska-Kentzer & Gilka **nov. spec.** Figure 19
Specimens examined: Holotype: ♂, United Arab Emirates, Hatta [24°49'N 56°07'E], 4–11.iv.2006, light trap, leg. A. van Harten. The holotype is deposited in the Department of Invertebrate Zoology, University of Gdańsk.

Description: Female unknown. Male. Body including scutellum dark brown. Legs yellowish. Palpus 5-segmented, third palpal segment with distinct sensory pit at apex. Fourth palpal segment with 1 seta. Flagellum composed of 13 flagellomeres. Flagellomeres 2–11 fused. Katepisternum with 1 long seta. Scutellum bearing 4 bristles. Vein M2 reduced. Wing membrane bare. Two very small and indistinct first radial cells present. First tarsomere of hind leg with simple spine-like palisade setae. Tibial comb of hind leg composed of 7 spines, tibial spur short. Genitalia as in Figure 19. Sternite IX without caudomedian excavation. Tergite IX with narrow apical portion; apicolateral processes ear-shaped, each with one small apical seta. Gonocoxite stout, ventral expansion triangular. Gonostylus short, stout, slightly curved, distal half gradually tapering to sharp apex. Aedeagus long and narrow, tongue-like, well sclerotized, apex blunt, single; basal arms relatively long. Parameres barely visible, fused, indistinct.

Diagnosis: In male genitalia the following characters form the unique combination of short and stout gonostylus, tongue-like aedeagus and tergite IX bearing ear-like apicolateral processes.

Distribution: United Arab Emirates.

Etymology: The species is named after Antonius van Harten in recognition of his valuable contributions to the study of the insect fauna of the Arabian Peninsula.



Figures 14-19. Males of *Brachypogon arabicus* nov. spec. (14-17), *B. obesus* nov. spec. (18), and *B. vanharteni* nov. spec. (19). 14: Palpus; 15, 18, 19: Genitalia in ventral aspect; 16: Aedeagus; 17: Parameres.

Genus *Serromyia* Meigen, 1818

Serromyia arabica Szadziewski, Gwizdalska-Kentzer & Gilka nov. spec.

Plates 3-6

Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Madaq [25°19'N 56°08'E], 6-13.v.2006, light trap, leg. A. van Harten. The holotype is deposited in the collection of the Department of Invertebrate Zoology, University of Gdańsk, Poland.

Description: Male unknown. Female. Body including legs brown to pale brown with distinct pattern of darker areas (Plates 3, 4). Palpus 5-segmented, fifth palpal segment darker. Flagellum with distal five flagellomeres elongate, AR 1.36. Scutellum with four long bristles. Wing length 1.15 mm, CR 0.57. Wing membrane without markings. Fore and mid legs slender, unarmed, with short equal simple claws. Hind femur enlarged, 4.6 times as long as greatest width, with a double row of 13-14 short, strong, black spines along ventral margin (Plate 3). Hind leg with single claw armed with short slender and sharply pointed basal spur. Hind claw 1.83 times longer than 5th tarsomere, about as long as tarsomeres 4 and 5 combined

(Plate 5). TR(I) 2.0, TR(II) 2.1, TR(III) 2.1. Two large subequal, ovoid seminal capsules present, 0.121 and 0.128 mm; neck not developed (Plate 6).

Diagnosis: The only species within the genus with females having two large seminal capsules, claw of hind leg 1.8 times longer than fifth tarsomere, body including legs brownish with pattern of pale and dark areas (see De Meillon & Wirth, 1983). *Serromyia mangrovi* Delecolle & Braverman (1987: 57) from Sinai in Egypt has smaller and spherical seminal capsules, shorter hind claw, 1.2 times longer than fifth tarsomere and body uniformly coloured without pattern of pale and dark areas, with almost yellow abdomen (paratypes examined).

Distribution: United Arab Emirates.

Genus *Stilobezzia* Kieffer, 1911

Stilobezzia harurii Boorman & van Harten, 2002

Plate 7–8, Figures 20–23

Specimens examined: Al-Ajban, 1♂, 10–17.x.2005, MT; 1♂, 4♀, 21.vii–19.ix.2006, MT. Sharjah Desert Park, 2♂, 18.i–25.ii.2005, LT; 5♂, 30.vi–21.vii.2005, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 26.iv–3.v.2006, LT. Wadi Safad, 1♀, 26.iv–4.v.2006, LT.

First description of female: Similar to male described by Boorman & van Harten (2002) from Yemen, with usual sexual differences. Body yellowish, palp dark brown, legs with brownish unclear rings, abdominal tergites with darker margins (Plate 8). Mandible armed with 7 strong teeth. Wing length 1.11–1.16 mm, CR 0.71, marking pattern as in Plate 7. Scutellum bearing 2 lateral and 2 submedian bristles. Fifth tarsomeres in all legs with single long claw armed with basal spur; basal spur of fore and mid legs long, slender and sharply pointed (Figs 20, 21); claw of hind leg shorter, basal spur short and blunt (Fig. 22). Fifth tarsomere of fore and mid legs armed with two ventral blunt spines, of hind leg unarmed (Figs 20–22). TR(I) 3.0–3.4, TR(II) 2.2–2.5, TR(III) 2.1–2.4. Seminal capsules symmetrical, 0.056–0.064 mm, well sclerotized, ovoid, with short neck (Plate 8, Fig. 23).

Distribution: Yemen (Boorman & van Harten, 2002). Reported for the first time from the UAE.

Tribe *Palpomyiini* Enderlein, 1936

Genus *Bezzia* Kieffer, 1899

Bezzia albicornis (Meigen, 1818)

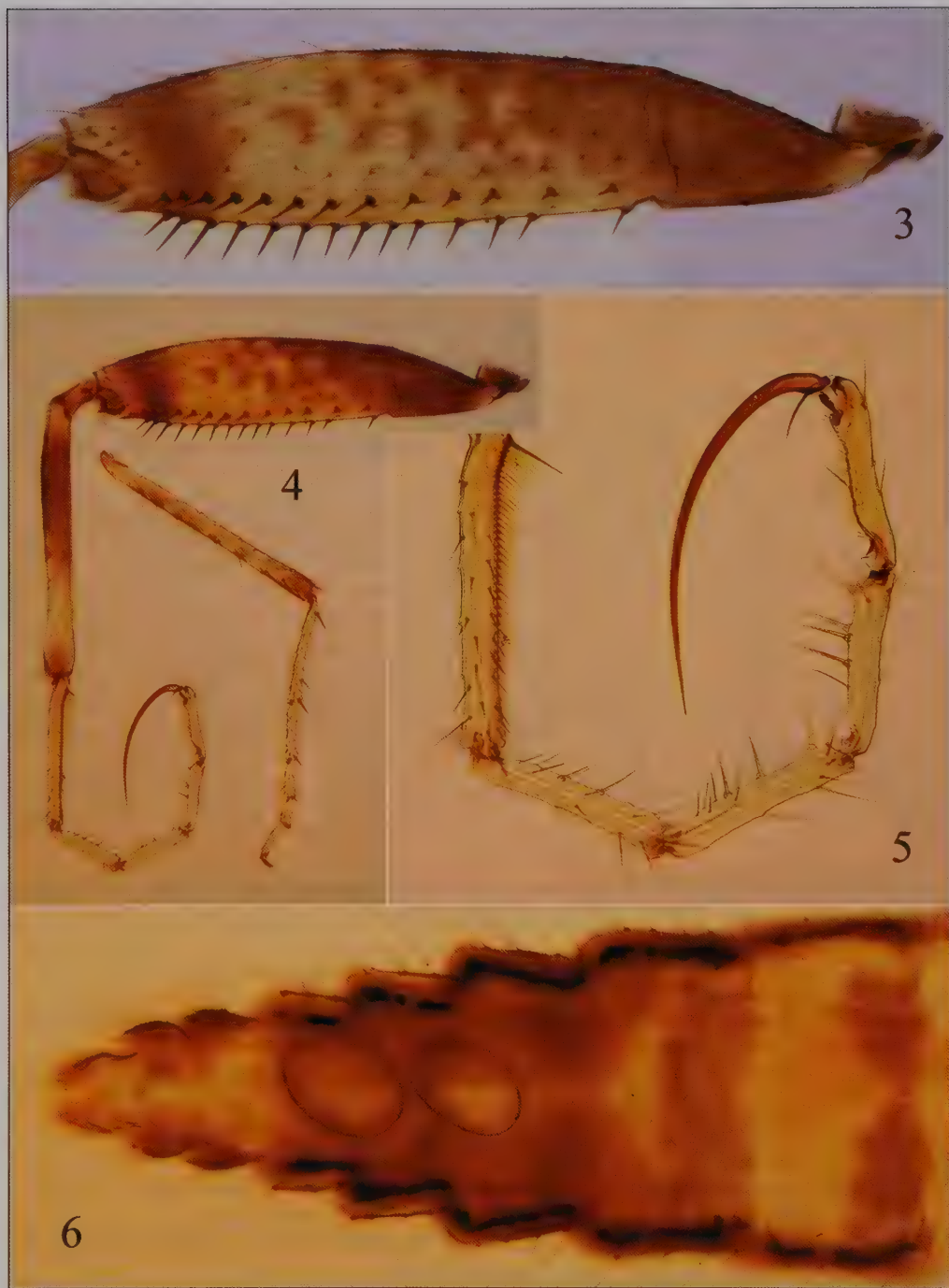
Specimens examined: Al-Ajban, 2♂, 1♀, 10–17.x.2005, MT; 1♂, 21.xii.2005, LT; 1♀, 2–9.iv.2006, LT. Sharjah Desert Park, 1♀, 30.vi–21.vii.2005, LT; 1♀, 15.xii.2008–12.i.2009, LT.

Distribution: Widely distributed in Palaearctic and Afrotropical regions. Reported for the first time from the UAE.

Bezzia omanensis Boorman & van Harten, 2002

Specimens examined: Fujairah, 1♂, 16–24.ii.2005, LT. Sharjah Desert Park, 9♂, 18–20.x.2005, LT; 1♂, 1–30.xi.2008, LT. SSW of ad-Dhaid, 1♂, 10–29.xii.2005, LT.

Distribution: Oman (Boorman & van Harten, 2002). Reported for the first time from the UAE.



Plates 3-6. *Serromyia arabica* nov. spec., female. 3: Femur of hind leg; 4: Hind leg, tibia and tarsus of fore leg; 5: Tarsus of hind leg; 6: Abdomen.



Plates 7-8. *Stilobezzia harurii* Boorman & van Harten, female. 7: Wing, 8: Abdomen.

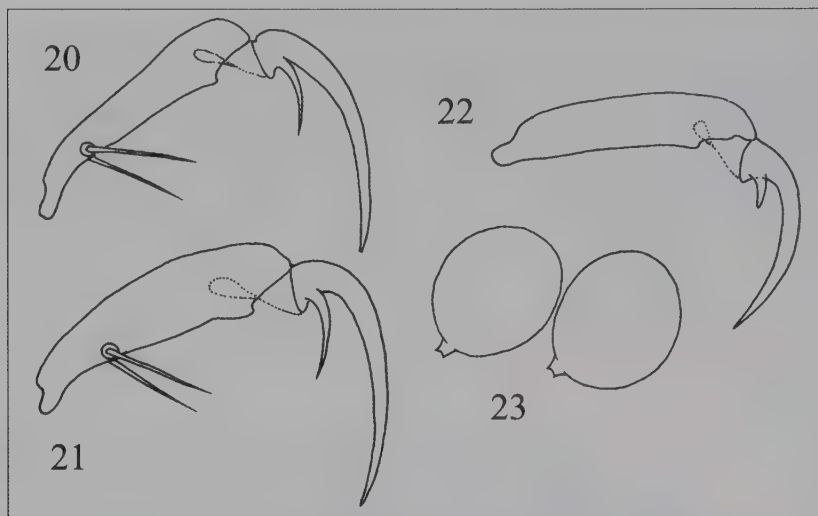
Genus *Palpomyia* Meigen, 1818

Palpomyia ebejeri Boorman & van Harten, 2002

Specimens examined: Hatta, 1♀, 30.i–26.ii.2006, LT. Wadi Madaq, 1♂, 27.xi.2005, LT.

First description of female: *P. ebejeri* was described by Boorman & van Harten (2002: 458) based on male. At present we found a female which is briefly described below. Similar to male with usual sexual differences. Length of flagellum 0.73 mm, AR 1.22. Wing length 1.77 mm, CR 0.78. Femora of all legs armed with ventral spines. TR(I) 1.8, TR(II) 2.5, TR(III) 2.8. Paratergite bare; anterior anepisternum with some simple setae; katepisternum bare; scutellum with four bristles. Seminal capsules small, spherical, with short neck, diameter 0.052 and 0.044 mm.

Distribution: Oman (Boorman & van Harten, 2002). Reported for the first time from the UAE.



Figures 20-23. *Stilobezzia harurii* Boorman & van Harten, female. 20: Fifth tarsomere of fore leg; 21: Fifth tarsomere of mid leg; 22: Fifth tarsomere of hind leg; 23: Seminal capsules.

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Authors' addresses:

R. Szadziewski, M. Gwizdalska-Kentzer, W. Gilka, University of Gdańsk, Department of Invertebrate Zoology, Pilsudskiego 46, 81-378 Gdynia, Poland; e-mail: RSz (biorys@ug.edu.pl), MG-K (mgk@ocean.univ.gda.pl), WG (w.gilka@wp.pl)

Order Diptera, family Cecidomyiidae

Subfamilies Lestremiinae and Micromyinae

Mathias Jaschhof & Catrin Jaschhof

INTRODUCTION

With more than 6000 species described, the Cecidomyiidae are one of the most species-rich families of the order Diptera. Three-quarters of these species are phytophagous and classified in the subfamily Cecidomyiinae, which we do not deal with here. The cecidomyiids we address in our paper, Lestremiinae and Micromyinae, are mycophagous and morphologically more primitive, for which reason they are placed at the base of Cecidomyiidae classification. Another ancient subfamily, the species-poor Catotrichinae, is absent in the United Arab Emirates. A fifth subfamily, Porricondyliinae, is definitely present in the Emirates, but its taxonomy is so poorly worked that type examination is usually the only way to arrive at certain species identifications.

Taxonomic deficiencies with Lestremiinae and Micromyinae become apparent as soon as extra-European taxa are concerned. This is also the case with the UAE fauna, which is a mix of elements from the Palaearctic, Afrotropical and Oriental Regions. Both Afrotropical and Oriental Lestremiinae and Micromyinae are in need of taxonomic revision, and exploration of their diversity is at a very early stage. As a result of this situation, several of our species identifications must be regarded as being tentative.

Lestremiinae and Micromyinae, collectively called the wood midges, are a primarily silvicolous group. Most of their species are found in moist natural forests. Therefore we may assume the extremely dry and vegetation-poor environment of the UAE is not a hotspot of wood midge diversity. Even so, our study shows that especially Lestremiinae can cope with such extreme environmental conditions, and some species may even be specialized to them. Where exactly they find niches to thrive remains unknown for the time being. At present we may just marvel on the enormous quantities of adult wood midges found in the course of the UAE Insect Project. Even more surprising, specimens have been captured by light and water traps, which both are collecting methods previously thought to be not especially prolific for wood midges (see Jaschhof & Jaschhof 2009: 30). Our own attempts to obtain specimens by hand-collecting during a visit in February 2009 resulted in frustration. One must suspect that adult activity is confined to the cooler early morning or even night hours — a suspicion that is particularly relevant for the summer months when wood midges are evidently “on the wing” in the Arabian desert, when conditions are, to human senses, almost unbearable. What the UAE Insect Project confirmed once again is the fact that some of the most intriguing Lestremiinae species are found outside woodlands. We would not be surprised if future surveys in open landscapes including deserts would reveal a generic diversity of Lestremiinae that is much greater than is known at present.

In the past the arid regions of the Earth have only occasionally been subject to studies of wood midges. Mamaev (1963), who studied mycophagous cecidomyiids in Central Asia, found a few species of Lestremiinae and Micromyinae. Jaschhof (1994) reported on findings of wood midges in Morocco. Prior to our study no information was available of the wood midges of the Arabian Peninsula and the United Arab Emirates (van Harten 2005), so all our findings are new records.

A total of 15 species were found, 12 Lestremiinae and 3 Micromyinae. Species found to occur in the Emirates have been originally described from the Palaearctic, Oriental and Afrotropical

Regions, and some of these species are distributed in all three regions. The following new taxa are described on the basis of specimens from the UAE: *Anarete bipartita* nov. spec., *Anarete conaretoidea* nov. spec., *Buschingomyia harteni* nov. gen., nov. spec., and *Tropaprionus* nov. gen. *Lestremia barberi* Felt, 1908 nov. syn. is synonymous with *Lestremia vernalis* Felt, 1908. The following species are transferred from the genus *Aprionus* to *Tropaprionus*: *T. aciculatus* (Mamaev, 1997) nov. comb.; *T. binarius* (Mamaev, 1998) nov. comb.; *T. congenericus* (Mamaev, 1998) nov. comb.; *T. ellipticus* (Mamaev, 1997) nov. comb.; *T. indicus* (Jaiswal, 1988) nov. comb.; *T. kivachensis* (Jaschhof, 2009) nov. comb.; and *T. plicatus* (Fedotova, 2004) nov. comb. *Allarete orientalis* (Grover, 1964) nov. comb. is transferred from *Lestremia* (*Anaretella*), and *Allarete indica* (Grover, 1964) nov. comb. is transferred from *Gongromastix*. *Allarete hindica* Jaschhof & Jaschhof nov. nom. is a replacement name for *Allarete indica* (Deshpande, Shaikh & Sharma, 2002), the latter being a junior secondary homonym of *Allarete indica* (Grover, 1964). The diagnostic characters and distinctness of the genera *Anarete* Haliday and *Conarete* Pritchard are discussed.

MATERIALS AND METHODS

Specimens studied have been collected in the course of the UAE Insect Project by Antonius van Harten assisted by Khalid Mahmood, if not stated otherwise. Van Harten (2008) has given a detailed introduction to the collection sites and methodology of the project he coordinates. Most of the extra-limital specimens studied here are from the Jaschhof collection in the Senckenberg Deutsches Entomologisches Institut (SDEI) Müncheberg, Germany; specimens studied of North American *Conarete* are from the National Museum of Natural History, Smithsonian Institution, Washington, DC. Most specimens were mounted on microscope slides according to the procedure explained by Jaschhof & Jaschhof (2009). Other specimens were identified to species in ethanol. The holotypes of the new species are deposited with the SDEI, paratypes and vouchers are deposited in both the SDEI and the UAE Invertebrate Collection (UAEIC). LT is the abbreviation used for light trap, WT for water trap. Morphological terminology and classification follows Jaschhof & Jaschhof (2009). Some terms that may be essential for those not knowing the group-specific literature are recapitulated here: concerning the antennal sensilla in Figure 24; wing in Figures 6, 22 and 52; male terminalia in Figures 23, 25, 26 and 57; and female terminalia in Figures 43 and 44. The arrangement of genera is in alphabetic order.

SYSTEMATIC ACCOUNT

Subfamily Lestremiinae

Included here is only one tribe, Lestremiini. Prior to this paper the Lestremiini comprised 12 genera and 97 species, to which we are adding 1 new genus and 3 new species. A conspicuous feature of the lestremiine fauna of the UAE is the presence of at least 6 species, of two genera, *Anarete* Haliday and *Conarete* Pritchard, renowned for their habit to form mating swarms. These swarms, which may comprise 20–200 individuals, occur typically during the morning hours and above markers, such as the tips of branches, tall herbs or grasses (Chiang 1963). The wing venation, which is typical of Lestremiinae, is shown in Figure 6.

Genus *Allarete* Pritchard, 1951

Diagnosis: This genus contains the Lestremiini with plesiomorphous wing features, such as a long apicR1; a long A1; a strongly convex anal lobe; and presence of ventral setae on R5, M, and occasionally A1, and which do not fit in other genera, such as *Buschingomyia* nov. gen. (see below), *Eomastix* Jaschhof, 2009 and *Gongromastix* Enderlein, 1936. The male genitalia of *Allarete* spp. are quite diverse, a fact raising doubts as to the monophyly of this genus. The two species found in the UAE are *Allarete* in the strict sense.

Distribution: *Allarete* spp. have been described from the Nearctic, Palearctic, Afrotropical, and Oriental Regions. The type species, *A. vernalis* (Felt), has a wide distributional range in the Holarctic Region, which extends possibly even into the Oriental Region (see below).

Allarete africana (Enderlein, 1911)

Figures 1–6, 8–9

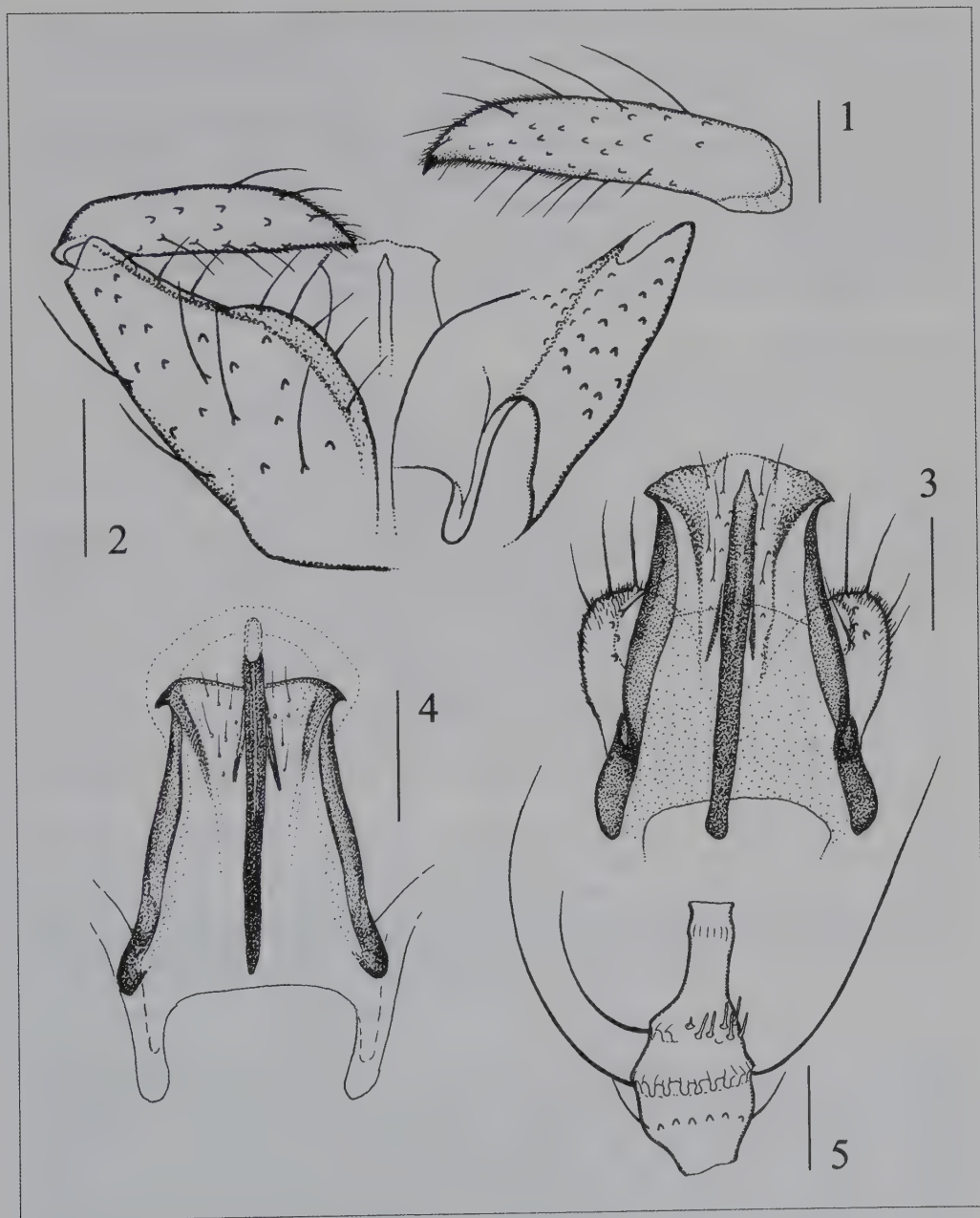
Slide-mounted specimens examined: al-Ajban, 1♂, 1♀, 17.x–9.ii.2005; 1♂, 9.ii–7.xii.2005; 2♂, 7–28.xii.2005; all LT. Fujairah, 1♂, 8.xii.2005–2.i.2006, LT. Hatta, 1♀, 4–11.iv.2006; 11♂, 2♀, 21.iv–16.viii.2006; 3♂, 3♀, 31.v–14.vi.2006; all LT. Khor Kalba (tunnel), 7–14.vi.2006, LT. Sharjah, 1♂, 1–31.i.2005, 2♂, 24.ix–9.x.2005, all LT. Sharjah Desert Park, 2♂, 20.x–24.xi.2007; 1♂, 24.vii–14.viii.2008; all LT; Wadi Madaq, 3♂, 27.ii–22.xii.2005; 2♂, 27.4–4.v.2006, all LT. Wadi Safad, 3♂, 20.v–17.vi.2006, LT.

Extra-limital specimens examined: 1♂, 1♀, Gold Coast [= Ghana], Accra, laboratory, Feb./March 1921, leg. J.W.S. Macfie (Cec. #14838 and #14839 in the Natural History Museum, London, presumably identified by F.W. Edwards).

Diagnosis: The male genitalia provide diagnostic specific characters. The gonostyli are elongate, straight and have 1 small pointed spine apically (Figs 1–2), and the tegmen has 2 short points apicolaterally (Figs 3–4). Females of *A. africana* are not easy to distinguish from *A. vernalis*. Side-by-side comparison reveals the flagellomeres and wings in *A. africana* are shorter (cf. Fig. 7 versus Fig. 9), but, as always with slide-mounted specimens, those morphometric differences should be considered with caution.

Redescription. Male. Body length: 1.4–2.1 mm. Head: Postfrons asetose. Ocelli 2. Eye bridge 2 facets long dorsally, 4–5 facets laterally. Scape slightly larger than pedicel, 14 flagellomeres. Neck of fourth flagellomere shorter than node; node with 1 whorl of short setae sub-basally, 1 complete and 1 incomplete crenulate whorl of long sensory hairs, numerous short hair-shaped translucent sensilla distally (Fig. 5). Palpus 4-segmented, basal segment with numerous short hair-shaped translucent sensilla, apical segment much longer than other segments. Thorax: Scutum with short lateral and dorsocentral setae. Wing (Fig. 6): Short, about as long as abdomen. Legs: Pretarsal claws curved, with very fine teeth. Empodia barely half as long as claws. Preabdomen: All sclerites but st 1 with short setae. Tergites 6–8 with strongly sclerotised basal margin (Fig. 8). Terminalia: Tg 9 with interrupted row of setae, basal margin strongly sclerotised, apical margin membranous, usually broadly rounded. Ventral bridge of gonocoxites short, membranous, asetose (Fig. 2). Gonostyli elongate, straight, with small pointed spine apically, 4 short bristles sub-apically (Figs 1–2). Tegmen slightly tapered towards apex, moderately sclerotised, collar-shaped apically, lateral corners pointed (Figs 3–4). Ejaculatory apodeme about as long as tegmen, well sclerotised, apex membranous, rounded to pointed, with reflected hooks at about half length that mark widening for muscle attachment (Figs 3–4). Apices of tegmen and ejaculatory apodeme together form membranous aedeagus head. Ejaculatory duct with cover of fine setae (Figs 3–4). Sternite 10 with 2 pairs of setae apically, without microtrichia. Cerci setose, pubescent (Fig. 3).

Female. Body length: 1.2–2.1 mm. Head: Scape and pedicel subequal in size, 9 neckless flagellomeres, apical flagellomere constricted. Fourth flagellomere slightly longer than wide,



Figures 1–5. *Allarete africana* (Enderlein), male (1–3, 5: specimen from Ghana; 4: specimen from UAE). 1: Gonostylus, dorsal view; 2: Terminalia, dorsal parts omitted, ventral view; 3: Ejaculatory apodeme, tegmen and cerci, ventral view; 4: Ejaculatory apodeme and tegmen, ventral view; 5: Fourth flagellomere, lateral view. Scale = 0.025 mm (for 1, 3–5) and 0.050 mm (for 2).

1 whorl of setae sub-basally, numerous short hair-shaped translucent sensilla on apical half (Fig. 9). Other characters as in male. Terminalia: 1 large ovate unsclerotised spermatheca. Basicercus as long as disticercus.

Remarks: Figures 1–3 and 5 depict the male specimen in the Natural History Museum, London, from Ghana. These drawings were made by M.J. during a visit to London in 1994 to study the Lestremiinae that had previously been studied by Edwards. *Allarete bharatica* Grover & Bakhshi, 1978, might be identical with *Allarete africana*, as one may judge from the original description of this species by Grover and Bakhshi (1978).

Distribution: Palaearctic Region: UAE (this work). Afrotropical Region: Somalia (Mamaev & Zaitzev, 1998), Tanzania (Enderlein, 1911), and Ghana (Edwards, 1938).

Allarete vernalis (Felt, 1908)

Figure 7

= *Lestremia barberi* Felt, 1908 **nov. syn.**

Slide-mounted specimens examined: Hatta, 1♂, 8–26.iv.2006, LT. Khor Kalba (tunnel), 7♂, 3♀, 31.i–21.ii.2006, LT. Sharjah, 27♀, 1.i–10.ii.2005, LT. Sharjah Desert Park, 3♀, 22.ii–16.iii.2005; 1♂, 20.x–8.xi.2005; 1♂, 20.x–24.xi.2007; 1♀, 24.xi–22.xii.2007; all LT. Wadi Bih, 9♂, 19.ii–1.iii.2008, LT. Wadi Madaq, 1♂, 27.xi–22.xii.2005, LT; 1♂, 20.i–3.ii.2008, WT. Wadi Safad, 2♂, 25.iii–1.iv.2006, LT. Wadi Wurayah, 16♂, 4♀, 15.i–22.ii.2009; 2♂, 23.ii–2.iii.2009; all LT.

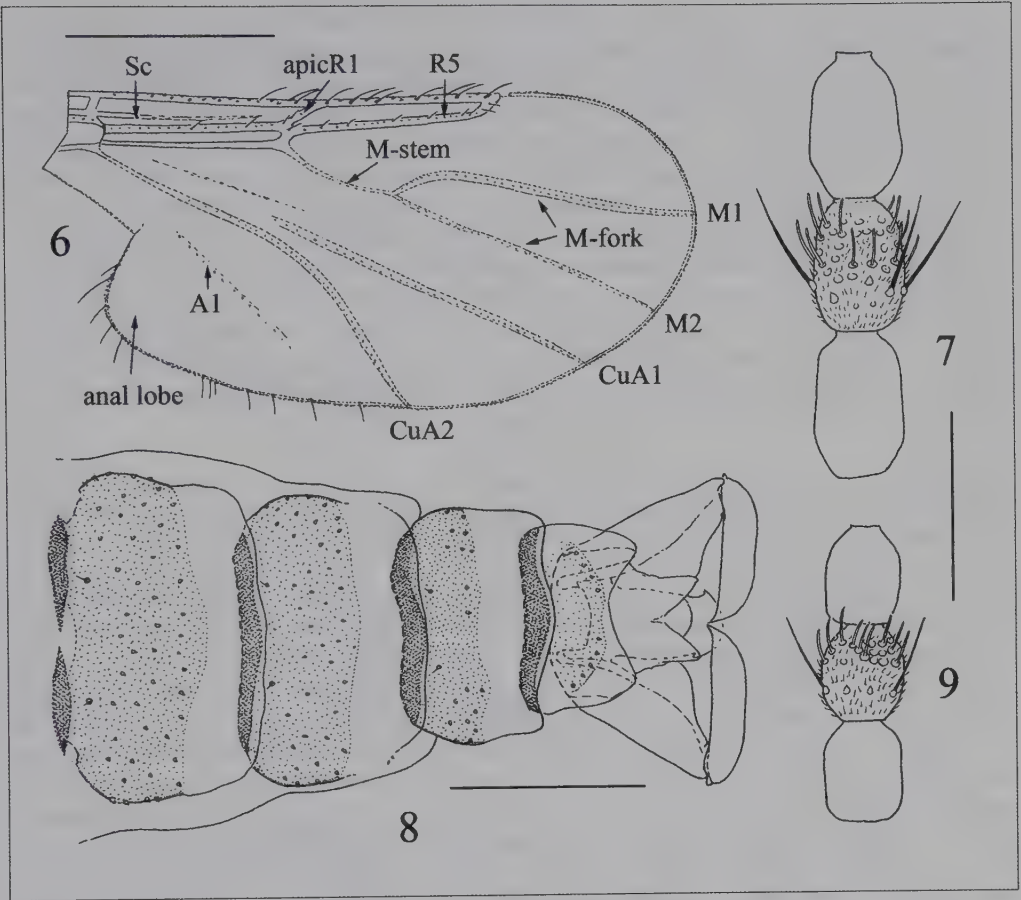
Diagnosis: Males have simple gonocoxites without projections ventromedially; the gonostyli are elongate, straight, and have a small flat spine apically that is surrounded by up to 4 stiff bristles; the tegmen is almost parallel-sided basally and then tapered towards the apex, which is usually membranous; and the ejaculatory apodeme is longer than the tegmen. A redescription of the male including figures of the terminalia, as well as a redescription of the female (as *A. barberi*) were given by Jaschhof (1998).

Supplement to the species redescription by Jaschhof (1998): Male abdominal tergites 6–9 have strongly sclerotised basal margins, similar to those in *Allarete africana*. Females have 1 large ovate unsclerotised spermatheca. Large-sized females may have 10 instead of 9 antennal flagellomeres.

Intraspecific variation: Never before have so many specimens of *A. vernalis* been available for study, which allows us to evaluate individual variation and artefacts better than before. Body size ranges from 1.3 to 2.1 mm in males, and from 1.8 to 3.1 mm in females. The density and distribution of setae on both the wing membrane and veins is subject to variation, while wing setae are generally sparser in *A. vernalis* than in many other Lestremiini. The outline of the gonostylus apex depends on the angle of view: while the apical spine may appear two-pointed at times, it is actually one-pointed and shaped like a fingernail. As the tegmen apex is membranous and unstable, its outline varies from almost pointed to truncate.

Remarks on synonymy: As assumed by Jaschhof (1998), *Lestremia barberi* and *Lestremia vernalis*, both described by Felt (1908), are the two sexes of one and the same species. Ours are the first findings of males and females in association, which enables us to establish the synonymy as given above. We also consider that *Allarete orientalis* (Grover, 1964) **nov. comb.**, *Allarete bhokarensis* (Deshpande, Shaikh & Sharma, 2002), *Allarete deepica* (Deshpande, Shaikh & Sharma, 2002); and *Allarete indica* (Deshpande, Shaikh & Sharma, 2002) may be identical with *Allarete vernalis*, based on their figures of the male terminalia.

Distribution: Nearctic Region: USA (California, Arizona, New Mexico, Texas, Kansas, Minnesota). Palaearctic Region: Germany, Italy, Croatia, Greece, Uzbekistan, Turkmenistan (Jaschhof 1998, Jaschhof & Jaschhof 2009), UAE (this work).



Figures 6–9. *Allarete africana* (Enderlein) (Figs 6, 8–9) and *Allarete vernalis* (Felt) (Fig. 7). 6: Male wing, setae on membrane omitted, dorsal view; 7: Female flagellomeres 3–5, lateral view; 8: Posterior abdomen of male, dorsal view; 9: Female flagellomeres 3–5, lateral view.

Genus *Anarete* Haliday, 1833

Diagnosis: Male *Anarete* and *Conarete* have strongly enlarged pedicels and a maximum of 9 flagellomeres, which compares with the 14 flagellomeres in most other Lestremiini. The flagellomeres in *Anarete* spp. usually lack both distinct necks and crenulate whorls of sensory hairs, with *A. allahabadensis* Grover, 1964 and a new species described below being the only exceptions. As these characters are usually used to distinguish between *Anarete* and *Conarete*, the existence of species with intermediate morphology raises doubts about whether or not it is legitimate to regard both as separate genera. Another character thought to be typical of *Anarete* is that the tines of the M-fork are more or less straight and clearly divergent from the beginning, which results in a V-shape (see Gagné 1995). As shown under the entry for *Conarete*, even this character is not absolutely diagnostic, and should be used only in combination with other characters. So far as is known, female *Anarete* always have bristles ventrally on the tarsi which are fewer in number, semi-erect, and slightly longer than those in *Conarete* spp.

Distribution: Species of *Anarete* have been found on all continents but Africa and Australia.

Remarks on species identification: Among the 33 *Anarete* species described are many that are morphologically extremely similar to one another, and some are presumably identical. A revision of their types is needed, but is unrealistic in so far as several institutions involved do not lend types abroad. As another problem, many species have been described on the basis of single or very few specimens, which is too few specimens in order to get an idea of individual variation and artefacts. Considering that similar problems exist with *Conarete* and *Micromya* spp., one may argue that adult morphology alone is not sufficient for distinguishing among species that swarm. Behavioural, chemical and ecological traits may be more important in maintaining interspecific barriers. As a result of this observation, many *Anarete* species cannot be positively identified on the basis of the descriptions and keys currently available. In spite of this situation we describe 2 new *Anarete* species from the UAE, as these have definite, species-specific characters. A third species from our material we leave unnamed.

***Anarete bipartita* Jaschhof & Jaschhof nov. spec.**

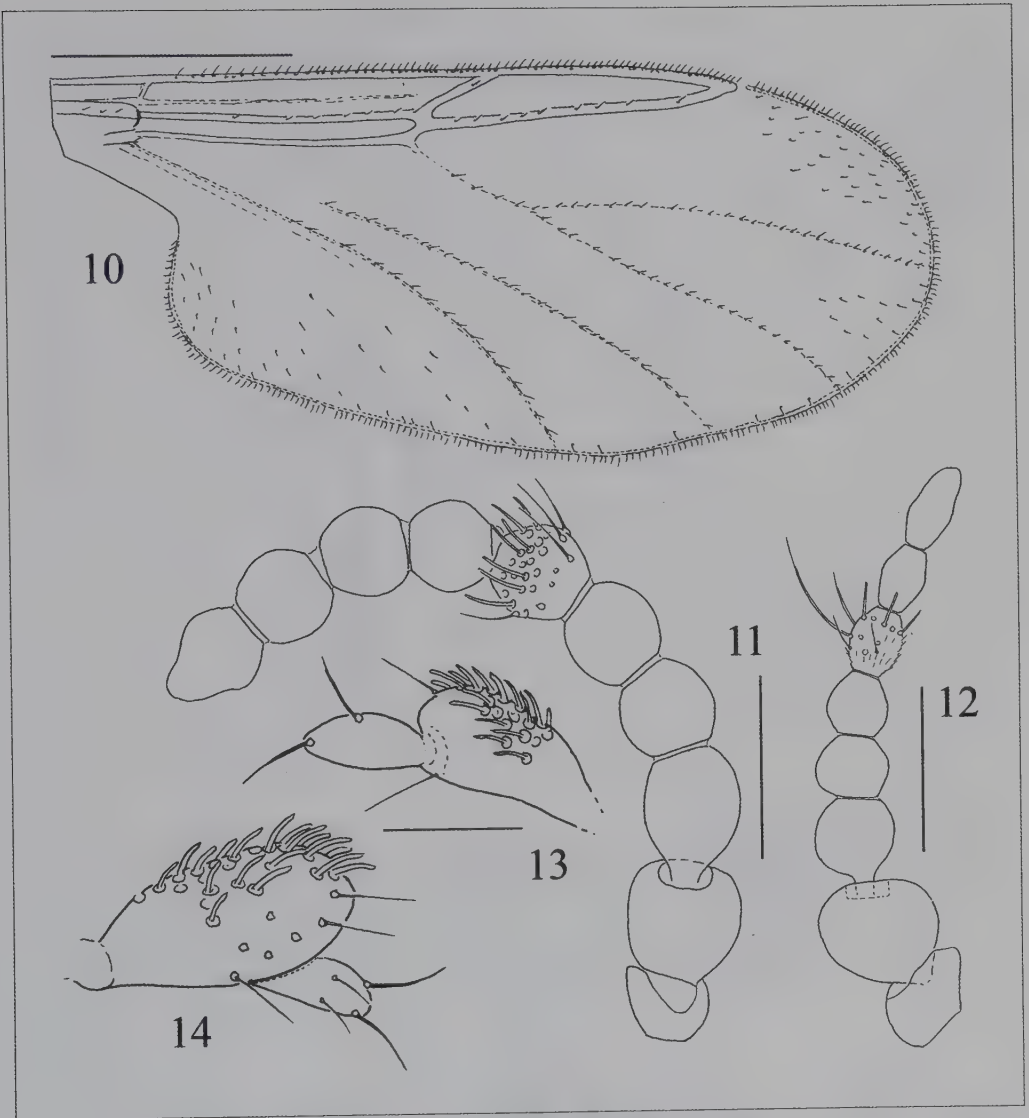
Figures 10–14, 16

Types. Holotype: ♂, UAE, Wadi Shawkah, 31.viii–11.ix.2008, by water trap, leg. A. van Harten (in SDEI). Paratypes: 2♂, same data as the holotype; 1♀, UAE, Wadi Safad, 25.iii–1.iv.2006, by light trap, leg. A. van Harten (in SDEI and UAEIC).

Diagnosis: This is the only *Anarete* species with very short and only 2-segmented palpi, with the apical segment being elongate ovate (Figs 13–14). All the other *Anarete* spp. known have 3 or 4 palpal segments, with the apical segment being elongate cylindrical.

Description. Male. Body length: 1.2–1.3 mm. Head: Postfrons asetose. Ocelli absent. Eye bridge 1–2 facets long dorsally. 6 neckless flagellomeres, apical flagellomere long, slightly constricted, fourth flagellomere with each 1 sparse whorl of short setae sub-basally and long sensory hairs medially, the medial whorl not crenulate, numerous hair-shaped translucent sensilla on apical half (Fig. 12). Palpus 2-segmented, basal segment thick, with numerous short hair-shaped translucent sensilla dorsomedially, apical segment much smaller, with 2–3 setae (Fig. 13). Thorax: Scutum with short lateral and dorsocentral setae. Wing (Fig. 10): Posterior veins very pale, recognizable mainly by their setae. Setae on membrane sparse, confined to peripheral areas apically and posteriorly. Legs: Pretarsal claws very slightly curved, toothless. Empodia very wide, longer than claws. Preabdomen: Terga and sterna with sparse short setae. Terminalia (Fig. 16): Tg 9 weak, setose, apical margin rounded (not figured). Ventral gonocoxal bridge membranous, asetose; medial gonocoxal bridge with several unusually strong setae. Gonostyli with large setae posteriorly, much smaller setae medially, somewhat flattened or even concave medially, strongly curved in apical third, 4 bristles sub-apically, a small bare portion apically. Tegmen weakly sclerotised, slightly tapered towards apex, apex slightly concave. Ejaculatory apodeme as long as tegmen, thin, sclerotised basally, membranous apically. Sternite 10 weak, pubescent. Cerci setose, pubescent. Female. Body length: 1.8 mm. Head: Ocelli absent. 8 neckless, subglobular flagellomeres, apical flagellomere slightly constricted, fourth flagellomere with sparse whorl of short setae sub-basally, many hair-shaped translucent sensilla on apical half (Fig. 11). Basal palpal segment enlarged, apical segment very small, inserted sub-apically on basal segment (Fig. 14). Compared with male, setae on membrane more numerous and dispersed, pretarsal claws slightly more curved, and empodia much smaller, barely half as long as claws. Other characters as in male. Terminalia: 1 large ovate unsclerotised spermatheca. Basicercus as long as disticercus.

Etymology: The name is Latin, *bipartitus* meaning bipartite, which refers to the 2-segmented palpi. Distribution: UAE (this work).



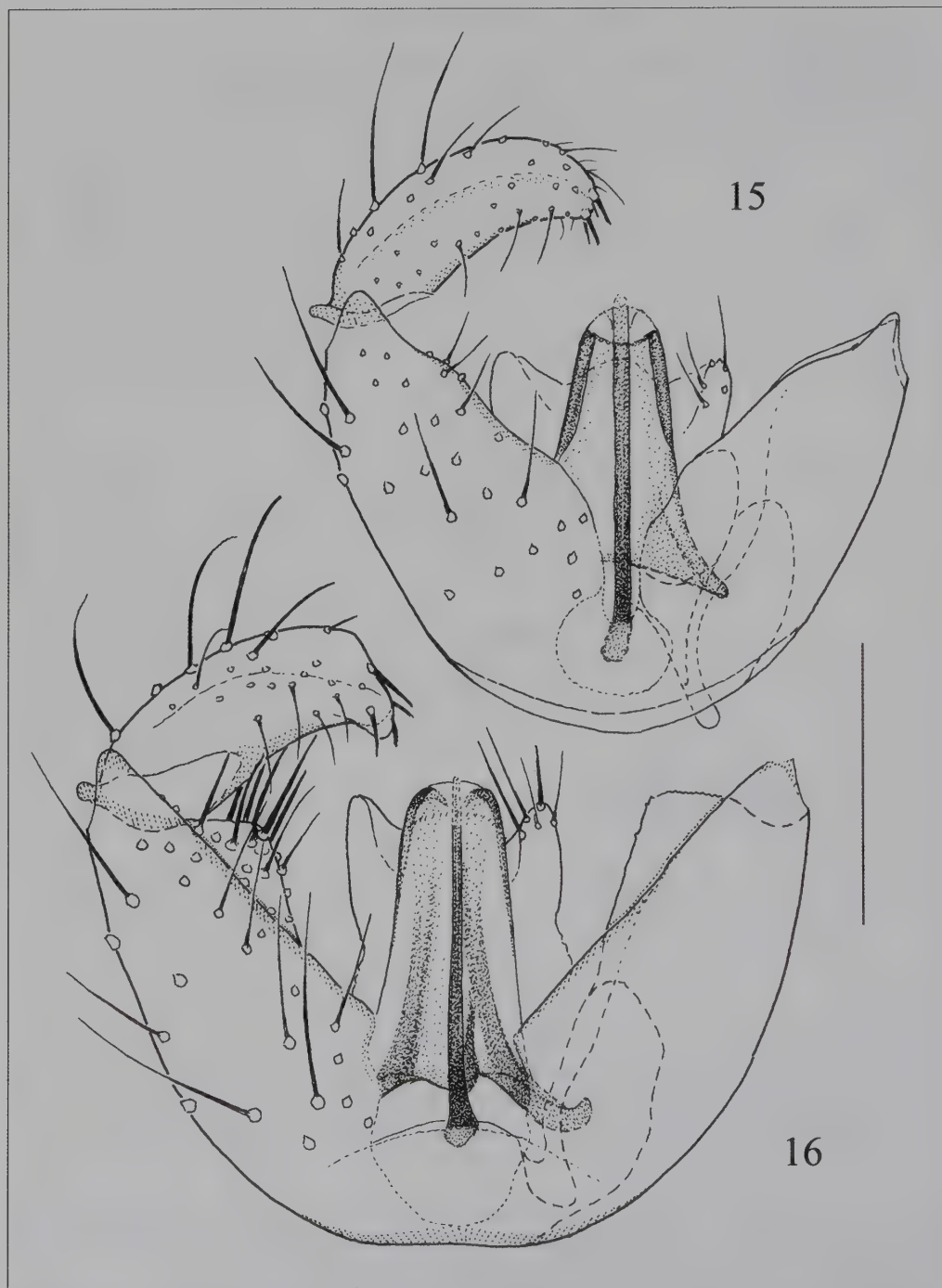
Figures 10–14. *Anarete bipartita* nov. spec. 10: Male wing, dorsal view; 11: Female antenna, lateral view; 12: Male antenna, lateral view; 13: Male palpus, dorsomedial view; 14: Female palpus, dorsomedial view. Scale = 0.250 mm (for 10), 0.050 mm (for 11–12) and 0.025 mm (for 13–14).

***Anarete conaretooides* Jaschhof & Jaschhof nov. spec.**

Figures 15, 17–21

Types. Holotype: ♂, UAE, Wadi Bih, 15–22 March 2007, by light trap, A. van Harten (in SDEI). Paratypes: 4♂, same data as the holotype (in SDEI and UAEIC).

Other slide-mounted specimens examined: Ad-Dhaid, 1♂, 10–29.xii.2005, LT. Al-Ajban, 1♂, 17.x–9.xi.2005; 2♂, 7–28.xii.2005; 1♂, 6–22.v.2006, all LT; 2♂, 9.ix–7.xii.2005, by Malaise trap. Fujairah, 1♂, 13.xi–10.xii.2005; 8♂, 8.xii.2005–2.i.2006; all LT. Hatta, 1♂, 16–30.viii.2006, LT. Khor Kalba (tunnel), 1♂, 16–23.i.2006; 1♂, 31.i–21.ii.2006; all LT. Sharjah Desert Park, 1♂, 20.x–8.xi.2005; 1♀, 11.xii.2005–18.i.2006; 5♂, 28.v–4.vi.2007; 14♂, 2♀, 20.x–22.xii.2007; all LT. Wadi Bih, 1♂, 19–



Figures 15–16. Male terminalia, ventral view. 15: *Anarete conaretooides* nov. spec.; 16: *Anarete bipartita* nov. spec.

25.ii.2009, Malaise trap, leg. A. Polaszek & M. & C. Jaschhof. Wadi Safad, 1♂, 27.xi–22.xii.2005; 2♂, 20.v–17.vi.2006, LT. Wadi Wurayah, 1♂, 18–25.iii.2007, Malaise trap.

Diagnosis: Male flagellomeres have both necks and crenulate sensory hair whorls (Figs 19–20), as is rather typical of *Conarete* spp., while the M-fork is clearly divergent (Fig. 17), as is typical in *Anarete* spp. Apart from our new species, such a mix of characters is known only from the Indian *Anarete allahabadensis* Grover. The male pretarsal claws are clearly different, two-pointed in *A. conaretoides* and, according to the description by Grover (1964), equipped with 3 large and 2 small teeth in *A. allahabadensis*. Taking the entire set of characters into account, our species should belong to *Anarete* rather than to *Conarete*.

Description. Male. Body length: 1.2–1.4 mm. Head: Postfrons asetose. Ocelli absent. Eye bridge 1–2 facets long dorsally. 8 flagellomeres, apical flagellomere long, constricted, all flagellomeres with 1 sparse whorl of short setae sub-basally, 1 incomplete whorl of long sensory hairs ventromedially, hair-shaped translucent sensilla distally, flagellomeres (3–)4–7 with short necks (Figs 19–20). Palpus 4-segmented, basal segment stout, with short hair-shaped translucent sensilla, other segments elongate subcylindrical, setose. Thorax: Scutum with short lateral and dorsocentral setae. Wing (Fig. 17): Posterior veins distinct. Setae on membrane sparse, confined to peripheral areas apically and posteriorly. Legs: Pretarsal claws curved, two-pointed, untoothed. Empodia moderately wide, half as long as claws. Preabdomen: Terga and sterna with sparse short setae. Terminalia (Fig. 15): Tg 9 weak, setose, apical margin rounded (not figured). Ventral gonocoxal bridge membranous, asetose. Gonostyli slightly flattened medially, slightly curved in apical third, large setae posteriorly, much smaller setae medially, 4 short bristles apically. Tegmen moderately sclerotised, slightly tapered towards apex, distolateral margins curved ventrally, apex slightly concave. Ejaculatory apodeme longer than tegmen, more strongly sclerotised basally than apically. Sternite 10 weak, pubescent. Cerci setose, pubescent.

Female. Body length: 1.8–2.0 mm. Head: Ocelli absent. 8 flagellomeres, subcylindrical, slightly longer than wide, with very short necks, apical flagellomere longest of all, not constricted, fourth flagellomere with whorl of setae sub-basally, many short hair-shaped translucent sensilla on apical half (Figs 18, 21). Legs: Pretarsal claws one-pointed, with 1 very fine tooth. Other characters as in male. Terminalia: 1 large ovate unsclerotised spermatheca. Basicercus as long as disticercus.

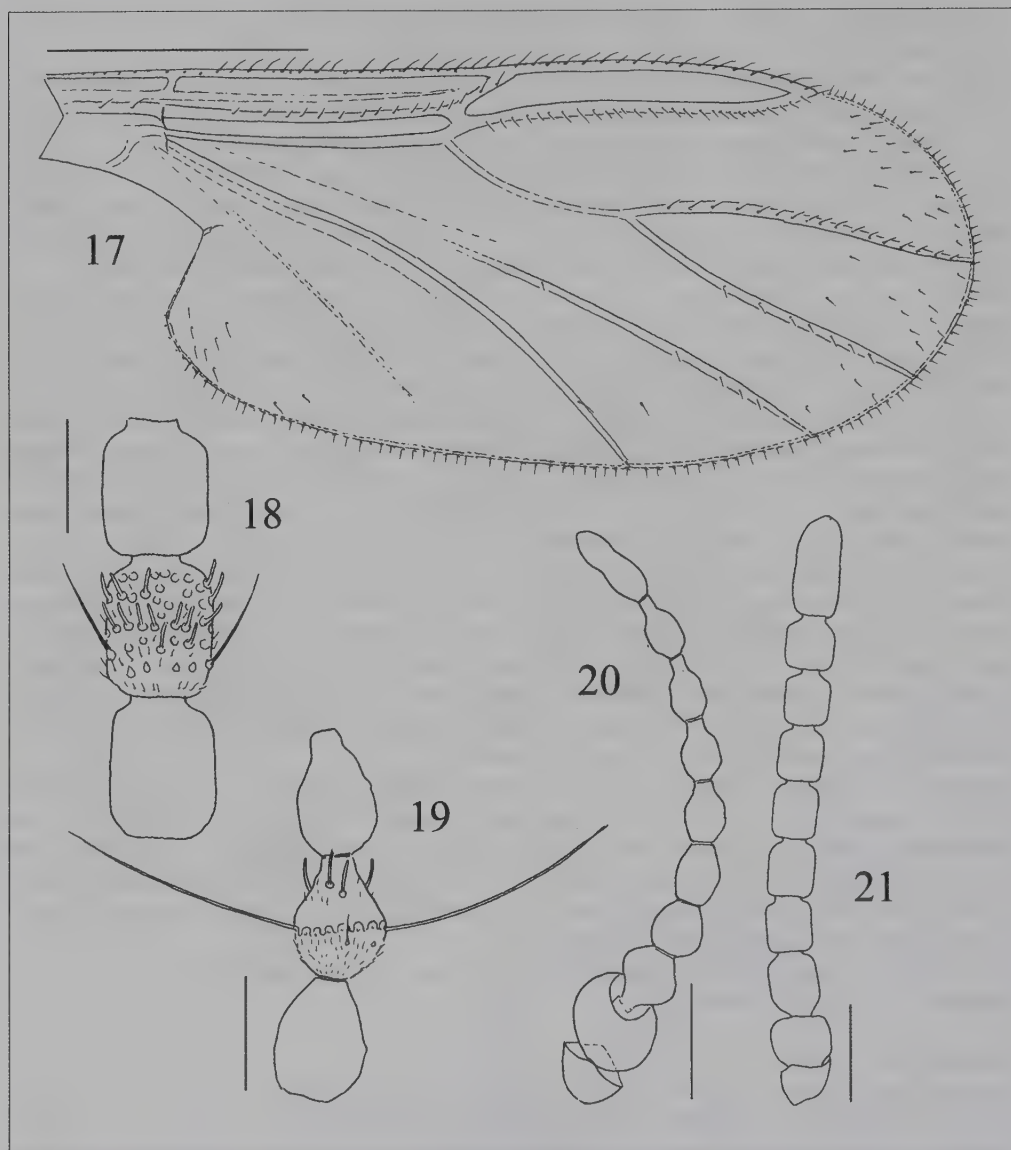
Etymology: The name refers to the similarity of this species with *Conarete* spp.

Distribution: UAE (this work).

Anarete spec.

Slide-mounted specimens examined: Wadi Maidaq, 6♂, 5♀, 20.i–3.ii.2008, WT.

Diagnosis: Males have 2 small ocelli; the eye bridge 0–1 facet long dorsally; 7–8 neckless, subglobular flagellomeres; 4-segmented palpi; the posterior wing veins weak; the alar setae few in number, confined to the apical portions of the membrane, the M-fork and occasionally CuA1; the pretarsal claws with 3 fine teeth; the empodia wide, longer than the claws; the gonocoxites longer than the average in *Anarete* spp.; the gonostyli concave medially, curved on apical half, with 4 short apical bristles; the tegmen poorly sclerotised, parallel-sided on the distal half, and pointed apically; and the ejaculatory apodeme longer than the tegmen. Females differ from males in having 8–9 flagellomeres; the first palpal segment swollen; slightly more alar setae including a few on the posterior areas of the membrane; and the empodia half as long as the claws. There are no unique characters that would differentiate this species from other *Anarete* spp. From the other 2 species in the UAE it differs, for instance, in the presence of ocelli, in the number and shape of the flagellomeres, and in the outline of the claws.



Figures 17–21. *Anarete conaretoides* nov. spec. 17: Male wing, dorsal view; 18: Female flagellomeres 3–5, lateral view; 19: Male flagellomeres 3–5, lateral view; 20: Male antenna, lateral view; 21: Female antenna, lateral view. Scale = 0.250 mm (for 17), 0.025 (for 18–19) and 0.050 mm (for 20–21).

Distribution: UAE (this work).

Genus *Anaretella* Enderlein, 1911

Diagnosis: *Anaretella* and *Allaretella* Meyer & Spungis, 1994, are the only genera of Lestremiini in which the presence of furcate or branched translucent sensilla on the antennae of both sexes is obligate. The sensilla branches in *Anaretella* are short, never reaching to the

flagellomere apex, while they are almost as long as the flagellomere neck in *Allaretella*. Other intergeneric differences concern the apex of the ejaculatory apodeme, which is curved ventrally in *Anaretella* and straight in *Allaretella*, and the tegmen apex, which is two-pointed in *Anaretella* and simply truncate in *Allaretella*.

Distribution: Cosmopolitan (Jaschhof & Jaschhof, 2009).

Remarks on species identification: Reports of *Anaretella* spp. from various parts of the World concern usually the species complex around *Anaretella defecta* (Winnertz). Morphological characters that would enable positive identification of the sibling species belonging here are not known (see Jaschhof & Jaschhof 2009: 65f.). Several of these species seem to have wide distributional ranges that may overlap. The group requires comprehensive revision on the basis of series of specimens of both sexes from all round the World.

Anaretella defecta (Winnertz, 1870) complex

Slide-mounted specimen examined: UAE, unknown locality and date, 1♂, leg. A van Harten.

Diagnosis: The gonostyli are elongate, and the tegmen is subtriangular and has 2 small membranous appendages apically. In males of *Anaretella iola* Pritchard, which is a similar species, the gonostyli are broad, and the tegmen is subrectangular and has 2 sclerotised processes apicolaterally (see Jaschhof 1998: fig. 22 versus fig. 23).

Distribution: Cosmopolitan (Jaschhof & Jaschhof 2009). New record for the UAE.

Genus *Buschingomyia* Jaschhof & Jaschhof **nov. gen.**

Type species: *Buschingomyia harteni* nov. spec., described below.

Diagnosis: The new genus combines several unusual lestremiine characters, such as the lack of ocelli, presence of the sc-r, and a long antC that extends almost to the apex of the wing. The two wing characters are also found in *Eomastix* Jaschhof, a monotypic genus from Scandinavia, in which, however, ocelli are present. Also, the M-fork in *Eomastix* is considerably longer than in *Buschingomyia* (see Jaschhof & Jaschhof 2009: Fig. 15A). A unique antennal character of *Buschingomyia* is the presence of hair-shaped sensilla below the crenulate sensory hair whorl; there are usually no sensilla in this part of the flagellomere.

Description (based only on males): Ocelli absent. Scape slightly larger than pedicel, 14 flagellomeres, flagellomere necks long, with several girdles of slits, nodes barrel-shaped, with crenulate sensory hair whorl and hair-shaped translucent sensilla. Maxillary palpus long, 4-segmented. Antepnotum setose. Scutum with lateral and dorsocentral setae. Wing: antC long, almost reaching apex of wing, sc-r present, R1 longer than in most other Lestremiinae, both Rs and r-m very short, M-stem comparatively long, M1 slightly sinuous, A1 long, ventral setae on both R1 and R5 apically, dorsal setae on all veins except h, sc-r, and m-cu, setae on membrane very sparse, confined to peripheral areas apically and posteriorly. Knob of haltere almost asetose, a few setae present in prolongation of stem. Legs long, almost twice as long as body, with ordinary setae, no scale-like setae. All tergites and sternites except st 1 setose. Abdominal tg 6–8 with strongly sclerotised basal margins. Terminalia see under *B. harteni*.

Relationship: Wing characters, which in *Buschingomyia* are basically in a plesiomorphic state, the massive gonocoxites, and the presence of several girdles of slits on the flagellomere necks are indications of a close relationship with *Eomastix*, *Gongromastix* Enderlein and *Mangogrostix* Mamaev. Moreover, *Buschingomyia*, *Gongromastix* and *Mangogrostix* share the reduced setae on the wing membrane, which may be another indicator of relationship.

Distribution: UAE (this work).

Etymology: We name this new genus to honour the late Dr Wolf-Dieter Busching, the former director of the Naumann Museum in Köthen, Germany, who died suddenly on February 15,

2010. With Wolf-Dieter we have lost a glowing ornithologist, entomologist, ethnologist, collector, traveller, and an honest soul.

***Buschingomyia harteni* Jaschhof & Jaschhof nov. spec.**

Figures 22–26

Types. Holotype: ♂, UAE, Wadi Safad, 15–22.iv.2006, by light trap, leg. A. van Harten (in SDEI). Paratype: ♂, UAE, Wadi Wurayah, 15.i–22.ii.2009, by light trap, leg. A. van Harten (in SDEI).

Diagnosis: There is only this one species of *Buschingomyia*, which can be distinguished from other lestremiines by characters of the genus.

Description. Male. Body length: 2.5 mm. Head: Postfrons asetose. Eye bridge 3 ommatidia long dorsally. Neck and node of fourth flagellomere subequal in length, node with 1 whorl of short setae sub-basally, 1 crenulate whorl with long sensory hairs medially, numerous short hair-shaped translucent sensilla each below and above the crenulate whorl, several long sensory hairs arising from crenulate alveoli distally (Fig. 24). First and second palpal segments with hair-shaped translucent sensilla, apical segment longest of all. Legs: Pretarsal claws slightly curved, toothless. Empodia vestigial. Terminalia: Tg 9 subtrapezoid, setose, basal margin strongly sclerotised (Fig. 26). Gonocoxites massive, membranous and asetose ventromedially (Fig. 26). Gonostyli elongate, parallel-sided, with short setae of which a part are apparently reflected, 1 pointed spine apically surrounded by 3–4 fine bristles sub-apically, a sclerotised fringe on posterior ridge (Fig. 23). Ejaculatory apodeme thick, strongly sclerotised, arrow-shaped apically (Fig. 25). Parameres very weak and pale, apparently not fused, at least not apically, apices slightly reinforced by sclerotisation, spread laterally, parameral apodemes slightly sclerotised, directed ventrally (Fig. 25). St 10 not discernible. Cerci large, setose.

Female and immature stages unknown.

Etymology: We name this species to honour Antonius van Harten for his contributions to the entomology of the Arabian Peninsula.

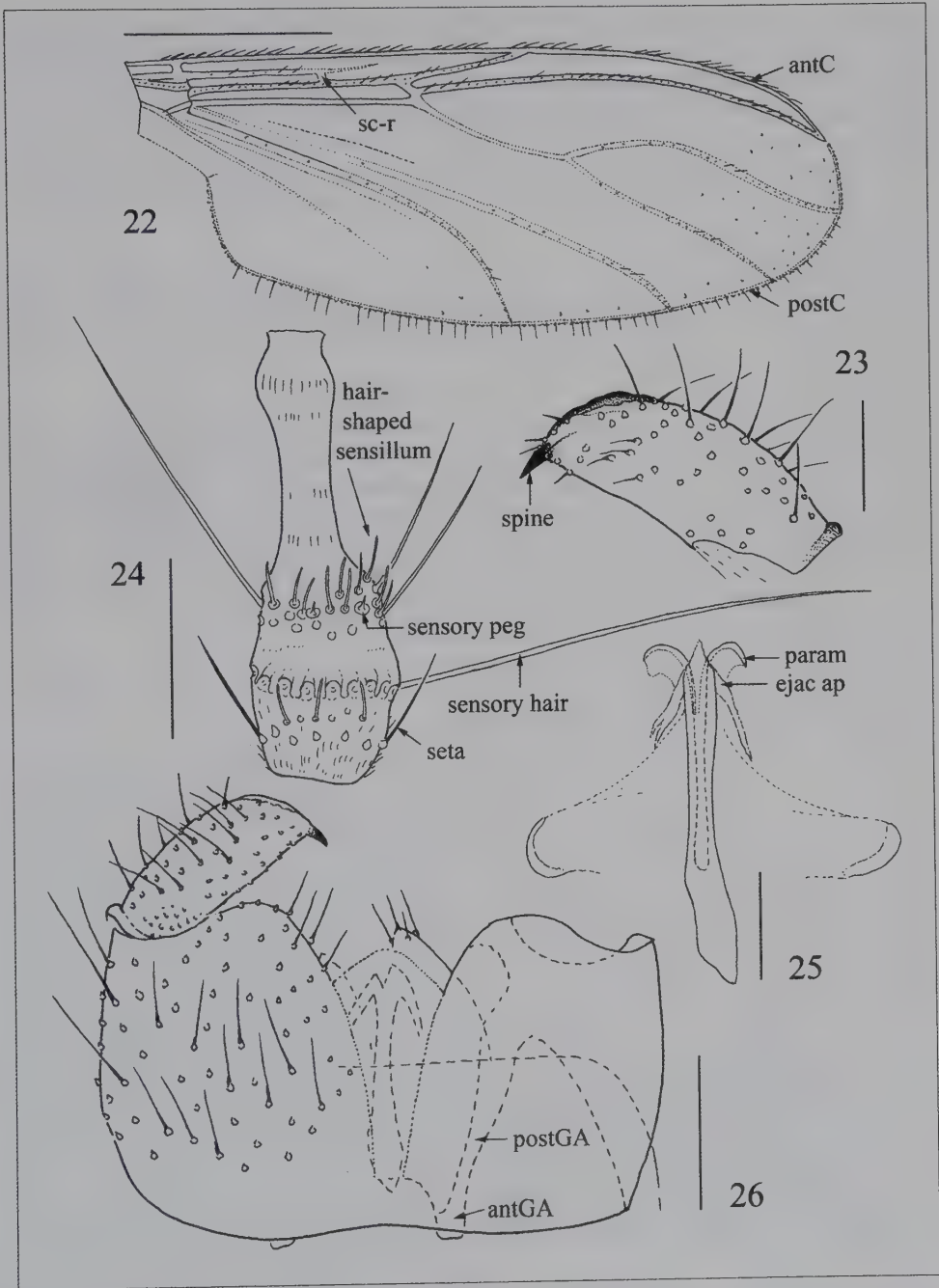
Distribution: As for the genus.

Genus *Conarete* Pritchard, 1951

Diagnosis: The male flagellomeres have distinct necks and crenulate whorls of sensory hairs. The tines of the M-fork are usually parallel, and M1 is usually slightly sinuous. *Conarete sicyoidea* Li & Bu is the only exception in this respect (see below). The *Conarete* spp. dealt with here are to our knowledge the only Lestremiini with microtrichia on the flagellomere necks (see also Li & Bu 2002: Figs 3, 4, 10, 11). Females have short erect bristles ventrally on the tarsi; in some North American species these bristles are much denser on the front tarsi than on the mid and hind tarsi.

Distribution: Species of *Conarete* have been found in all biogeographic regions except the Australasian Region. Two species described from India were recorded once in the Palaearctic and Afrotropical Regions, respectively: *Conarete indorensis* Grover, 1970, in Shaanxi Province, China (Li & Bu, 2002), and *Conarete calcuttaensis* (Nayar, 1949) in Natal, South Africa (Gagné, 1995). As a noteworthy fact, *Conarete* spp. are lacking in Europe, which is better studied for Lestremiinae than any other part of the world.

Remarks on species identification: All the Old World species have been described from the Oriental Region: 2 species from China and 6 species from India. Their types, which are not available for lending abroad, have never been examined together. Nevertheless, type-based revision should precede any future descriptive work. The descriptions, particularly of the Indian species, are insufficient for positive identification. We have identified 3 species of *Conarete* in the UAE. One species is apparently *Conarete sicyoidea* from China, which has



Figures 22–26. *Buschingomyia harteni* nov. gen., nov. spec., male. 22: Wing, dorsal view; 23: Gonostylus, dorsal view; 24: Fourth flagellomere, lateral view; 25: Ejaculatory apodeme and tegmen, ventral view; 26: Terminalia, ventral view. Scale = 0.500 mm (for 22), 0.025 mm (for 23, 25) and 0.050 mm (24, 26). Abbreviations: antGA, anterior portion of gonocoxal apodeme; ejac apod, ejaculatory apodeme; param, paramere; postGA, posterior portion of gonocoxal apodeme.

quite distinctive male genitalia (Li & Bu, 2002: Fig. 14). Another of our species may be *Conarete calcuttaensis* that we identified on the basis of the figures and discussion by Gagné (1995). The descriptions of these two species are supplemented here. If our identifications are correct, they confirm that species of Lestremiinae, including *Conarete*, may have wide distributional ranges that may include more than one biogeographic region. Our third species is very similar to both *C. sicyoidea* and *C. calcuttaensis*. As we cannot decide whether or not this species is among the *Conarete* described from India, we refrain from giving it a name.

Conarete sicyoidea Li & Bu, 2002

Figures 27–32

Slide-mounted specimens examined: Al-Ajban, 3♂, 18.vii–15.viii.2006, LT. Bithnah, 2♂, 26.v–11.vi.2006, LT. Hatta, 12♂, 6♀, 21.iv–30.viii.2006, LT. Sharjah Desert Park, 1♂, 17–24.vii.2008; 2♂, 24.vii–14.viii.2008; all LT. Wadi Safad, 1♂, 20.v–17.vi.2006; 1♂, 22.vii–9.ix.2006; all LT. Wadi Shawkah, 1♂, 31.viii–11.ix.2008, WT.

Diagnosis: Males have 8–9 flagellomeres, which depends on whether the 2 apical flagellomeres are separate, or fused and then constricted medially (Fig. 30). Most of our specimens have 9 flagellomeres. The flagellomere necks are slightly longer than in the other two *Conarete* species in the UAE (Fig. 29). The pretarsal claws have (3–)4 large and 1 small teeth (Fig. 28). The gonostyli are swollen basally, then strongly narrowed, with the most apical portion broader again (Fig. 31). The tegmen is constricted sub-apically, the portion beyond the constriction is weakly membranous and with 2 small sclerotised areas laterally (Fig. 32). The ejaculatory apodeme is apparently bent dorsally just before the apex; the apices of apodeme and tegmen are fused, resulting in a sclerotised point (Fig. 32).

Intraspecific variation: In some specimens the M-fork is slightly divergent and M1 is not sinuous (Fig. 27). All posterior veins, including M, are usually very pale and recognizable mainly by their setae. The length of r-m is variable.

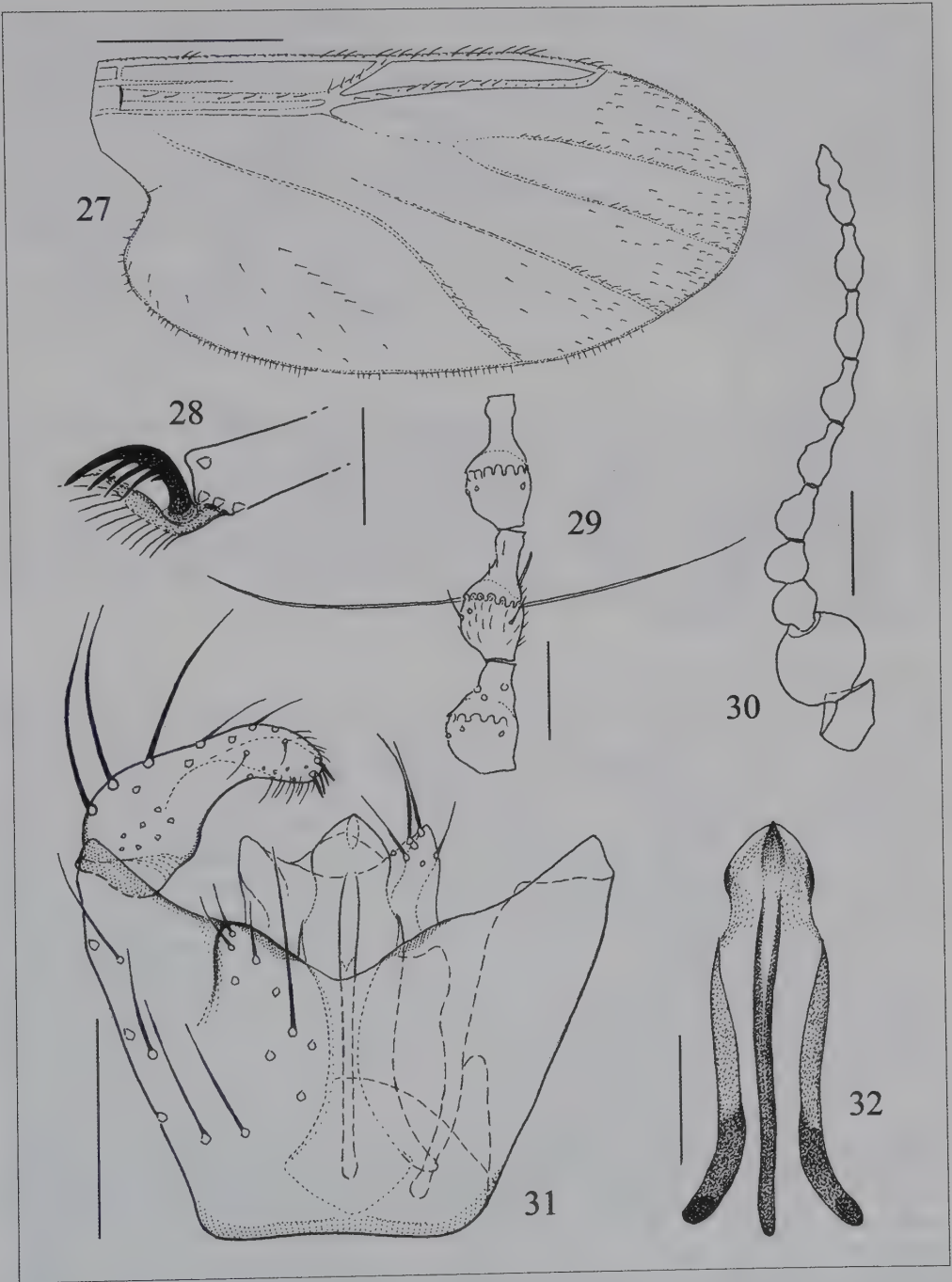
Supplement to the description by Li & Bu (2002): Setae on the wing membrane in males are confined to the peripheral areas apically and posteriorly (Fig. 27). The empodia in our specimens are as long as the claws, not half as long as originally described. The apical margin of tg 9 is rounded. The gonocoxites are slightly swollen on either side of the ventral emargination (Fig. 31). The gonostyli bear 4 short, stiff apical bristles (Fig. 31) as in other *Conarete* spp. Females of *A. sicyoidea* are here reported on for the first time. Ocelli are lacking, as in males. The eye bridge is 2–4 facets long dorsally, which is slightly longer than in males. There are 9 neckless flagellomeres, the apical flagellomere is constricted. Flagellomeres 2–6 are subglobular, 7–8 are longer than wide, all have a whorl of short setae basally and numerous short hair-shaped translucent sensilla distally. The translucent hair-shaped sensilla on the first palpal segment are very dense, in contrast to the males in which they are scattered. The pretarsal claws are strong and toothless. The empodia are half as long as the claws. The tarsi have short stiff erect bristles ventrally, which are longer and less numerous compared with the North American species. The posterior wing veins are stronger than those in males, and the setae cover larger portions of the membrane. One large unsclerotised discoid spermatheca is present.

Distribution: Oriental Region: Hainan Province, China (Li & Bu 2002). Palaearctic Region: UAE (this work).

Conarete ?calcuttaensis (Nayar, 1949)

Figures 33–37

Slide-mounted specimens examined: Al-Ajban, 5♂, 18.vii–15.viii.2006, LT. Near Mahafiz, 1♂, 14–21.vi.2006, LT. Sharjah Desert Park, 4♂, 20.x–8.xi.2005; 1♂, 24.xi–22.12.2007; 12♂, 17–14.vii.2008; all LT. Wadi Safad, 1♂, 22.vii–9.ix.2006, LT.



Figures 27–32. *Conarete sicyoidea* Li & Bu, male. 27: Wing, dorsal view; 28: Pretarsus of fore leg, lateral view; 29: Flagellomeres 3–5, lateral view; 30: Antenna, lateral view; 31: Terminalia, ventral view; 32: Ejaculatory apodeme and tegmen, ventral view. Scale = 0.250 mm (for 27), 0.025 mm (for 28–29, 32) and 0.050 mm (for 30–31).

Diagnosis: This species is very similar to *Conarete sicyoidea*, differing from it as follows. Our males have usually 8, rarely 9 flagellomeres (9 is the number previously described), the flagellomere necks are shorter than in *C. sicyoidea* (Figs 36–37). The pretarsal claws of males each have 1–2 large and small teeth (Fig. 34). The gonostyli are less swollen basally and not so strongly narrowed sub-apically as in *C. sicyoidea*. The tegmen is more robust, broadest sub-apically due to membranous lateral projections, and has a pigmented ovate cavity on the apical third (Fig. 35). The ejaculatory apodeme is straight and well sclerotised throughout (Fig. 35). All specimens studied have the M-fork as is typical of *Conarete* (see Gagné, 1995: Fig. 4). We have not identified females of this species from our samples.

Distribution: Oriental Region: West Bengal, India (Nayar, 1949). Afrotropical Region: Natal, South Africa (Gagné, 1995), Togo (Jaschhof, unpublished). Palaearctic Region: UAE (this work).

Conarete spec.

Slide-mounted specimens examined: Khor Kalba (tunnel), 2♂, 4–11.iv.2006, LT. Wadi Safad, 1♂, 22.vii–9.ix.2006, LT. Wadi Shawkah, 1♂, 31.viii–11.ix.2008, WT.

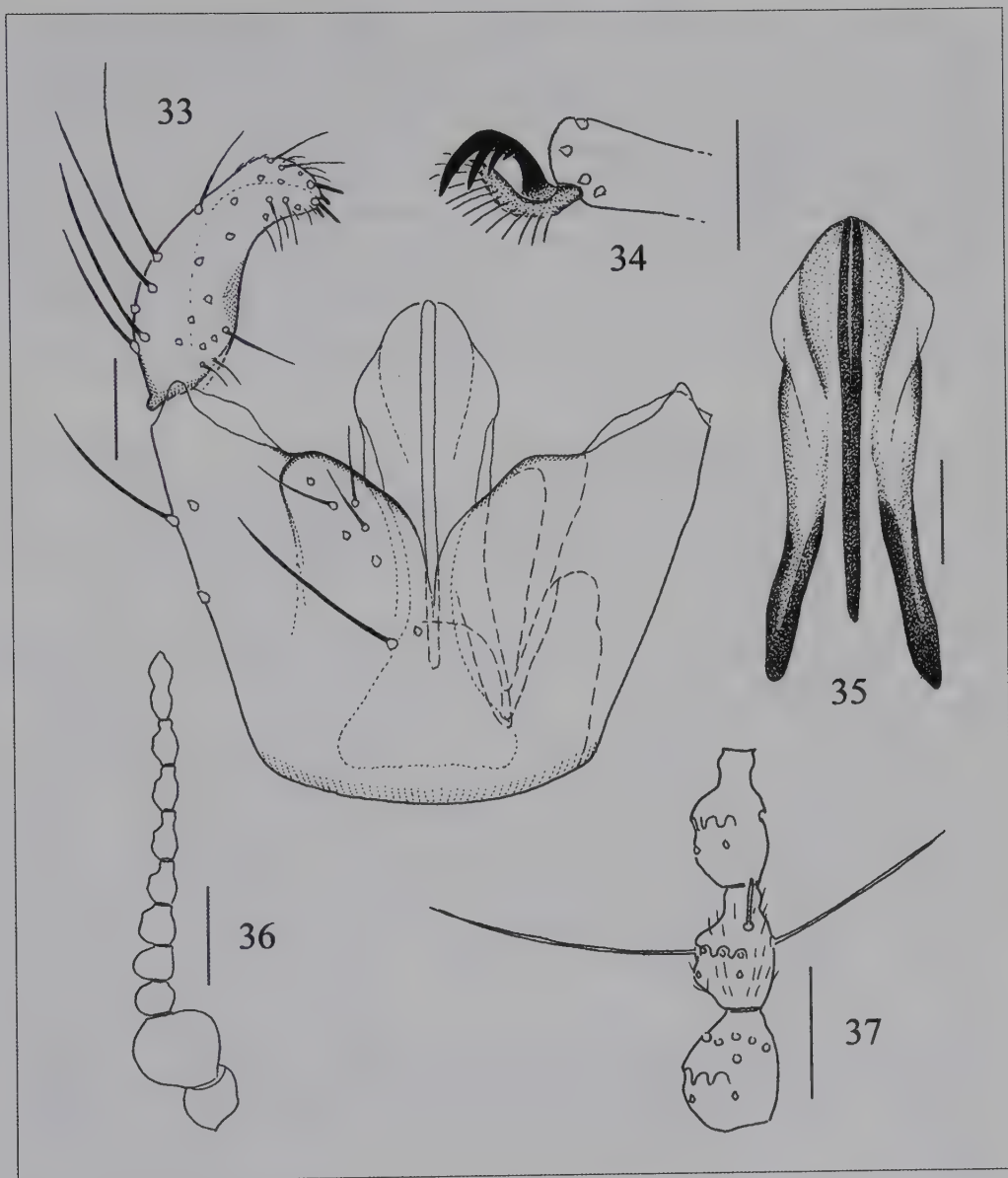
Diagnosis: Males have 8 flagellomeres, the necks are as short as in *C. calcuttaensis*, the apical flagellomere is long and constricted. The pretarsal claws have 2 large and 1 small teeth. The basal half of the gonostylus is thick, the distal portion is evenly tapered towards the apex (not unlike fig. 14 in Li & Bu, 2002). The tegmen is similar to that in *C. calcuttaensis*, while the ejaculatory apodeme is like that in *C. sicyoidea*.

Distribution: UAE (this work).

Genus *Mangogrostix* Mamaev, 1985

This genus was founded for *Gongromastix orientalis* Grover, 1964, the type species, and *Gongromastix indica* Grover, 1964, both from India. Grover (1964) suspected that *G. orientalis*, which she described from a single male, might possibly be identical with *G. indica*, of which she had only two females. Mamaev (1985), who had probably seen the types of both species during his visits to India in 1974 and 1977, respectively (Anonymous, 1978), referred to the following characters of *Mangogrostix* as distinguishing it from *Gongromastix* Enderlein, 1936: the wings are short; the male flagellomeres are short-necked; males lack ocelli; and the antennal translucent sensilla of females are hair-shaped. According to Mamaev's (1985: 27) key, the antennae of *Mangogrostix* females should have 10–11 flagellomeres, whereas *G. indica* was described as having only 9 flagellomeres. Unexpectedly, we found *Mangogrostix orientalis* to be present in the UAE, which is only the second finding of this species during 50 years. We identified the males on the basis of the original description, in particular the figures of the genitalia (Grover, 1964: Pl. 3, Figs 1–3). Our females, which are without doubt conspecific with the males, have nothing in common with the females Grover (1964) described as *Gongromastix indica*. This species cannot belong to either *Mangogrostix* or *Gongromastix*, as the basicerci are approximately as large as the disticerci, not clearly larger as they should be (see Grover 1964: Pl. 3, Fig. 8). We consider it to be a species of *Allarete*, and one that may be identical with one of the species described by Deshpande et al. (2002) on the basis of males. In so doing, *Allarete indica* (Deshpande, Shaikh & Sharma, 2002) becomes a junior secondary homonym of *Allarete indica* (Grover, 1964) **nov. comb.** As a replacement name we propose *Allarete hindica* Jaschhof & Jaschhof **nov. nom.**

Diagnosis: Both sexes lack ocelli. Among Lestremiini total loss of ocelli is otherwise confined to *Buschingomyia*, *Anarete* spp. and *Conarete* spp. For differences between



Figures 33–37. *Conarete ?caluttaensis* (Nayar), male. 33: Terminalia, ventral view; 34: Pretarsus of fore leg, lateral view; 35: Ejaculatory apodeme and tegmen, ventral view; 36: Antenna, lateral view; 37: Flagellomeres 3–5, lateral view. Scale = 0.025 mm (for 33–35, 37) and 0.050 mm (for 36).

Mangogrostix and *Buschingomyia*, see under the latter. Males of *Mangogrostix* have pedicels of ordinary size and 13–14 flagellomeres, whereas males of *Anarete* and *Conarete* have strongly enlarged pedicels and maximally 9 flagellomeres. Females of *Mangogrostix* have a sclerotised spermatheca, whereas the spermatheca in most other Lestremiini is unsclerotised.

The spermathecae of *Mangogrostix* and *Eomastix* are similar, but *Eomastix* Jaschhof, 2009, differs from *Mangogrostix* in the long antC that reaches the apex of the wing. In *Mangogrostix* the copulatory organ including the parameres is quite unlike the homologous structures in other Lestremiini, which is another good argument for its generic separation.

Relationship: *Mangogrostix*, *Gongromastix* and *Eomastix* belong to a group of genera which have several characters in common, such as the massive male gonocoxites and the enlarged basicerci of females. Male flagellomeres bear only 1 crenulate whorl of sensory hairs, which is often incomplete dorsally. Wing characters are basically in a plesiomorphic state, which is variously demonstrated by the fact that antC, R1, the M-fork and A1 are long; sc-r and A2 are present; and ventral setae are present on some of the veins. *Buschingomyia*, of which females are not known, may also belong to this group of genera.

Distribution: Oriental Region: Uttar Pradesh, India (Grover, 1964). Palaearctic Region: UAE (this work).

***Mangogrostix orientalis* (Grover, 1964)**

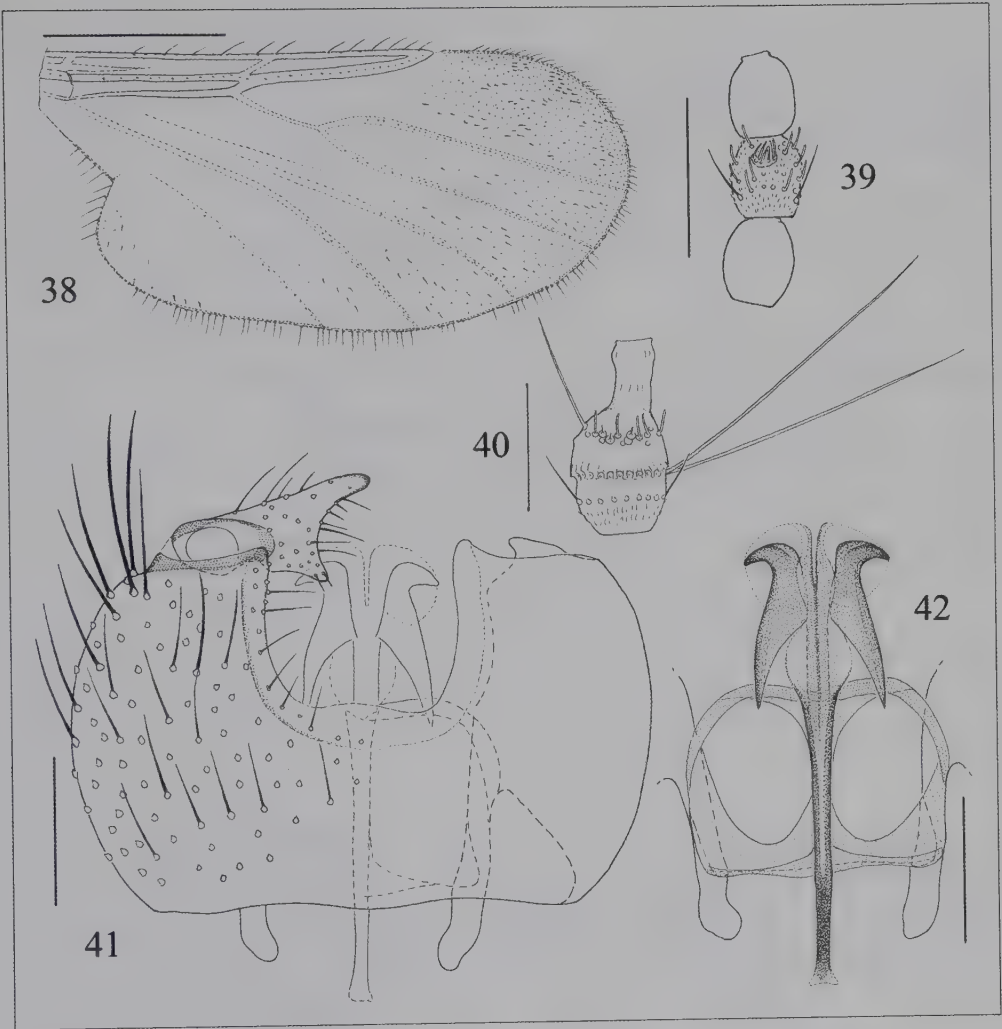
Figures 38–44

Slide-mounted specimens examined: Al-Ajban, 3♂, 1♀, 29.v–19.vi.2006, LT. Hatta, 3♀, 16–30.viii.2008, LT. Near Mahafiz, 1♂, 14–21.vi.2006, LT. Wadi Safad, 5♂, 18.vii–15.viii.2006; 1♂, 1♀, 22.vii–9.ix.2006; all LT. Wadi Shawkah, 13♂, 1♀, 31.viii–11.ix.2008, WT.

Diagnosis: As this is the only species of *Mangogrostix*, it can be readily identified by the characters of the genus.

Supplement to the description by Grover (1964). Male. Body length: 1.2–2.2 mm. Head: Postfrons aetose. Eye bridge 1–2 facets long dorsally. Scape larger than pedicel, 13–14 flagellomeres, which depends on whether or not the 2 apical flagellomeres are fused. Neck of fourth flagellomere shorter than node; node with 1 whorl of short setae sub-basally, 1 complete crenulate whorl and 0–2 crenulate rows of long sensory hairs, numerous short hair-shaped translucent sensilla and several sensory pegs with large alveoli distally (Fig. 40). Palpus typically 4-segmented, occasionally 3-segmented, in one of the specimens 3 and 4 segments on either side. Thorax: Scutum with short lateral and dorsocentral setae. Wing (Fig. 38): Clearly shorter than body. AntC short; R1 short, aetose; M-fork long, tines almost parallel to each other; A1 long, often reaching wing margin. Ventral setae on R5 apically. Setae confined to apical half and posterior periphery of wing membrane. Legs: Pretarsal claws with 3 very fine teeth. Empodia 1/3 as long as claws. Preabdomen: Setae on tergites accumulated laterally and posteriorly. Anterior margins of tg 5–7 strongly sclerotised laterally and of tg 8 entirely. St 1 aetose. Terminalia: Tg 9 large, subtrapezoid, basal margin strongly sclerotised, apical margin with 2 small subtriangular projections (not figured). Gonocoxites massive, with setae of various lengths including some large setae apicolaterally, ventral emargination U-shaped, ventrobasal bridge long, antGA extending beyond ventrobasal margin (Fig. 41). Gonostylus small, flattened, with short sparse setae, 2 short finger-like projections medially, the shorter projection with very short bristles apically, the longer projection with broad rounded spine apically (Fig. 41). Copulatory organ and parameres form a complex three-dimensional structure that is connected to the gonocoxal apodemes via 2 horizontal bridges (Fig. 42). St 10 not traceable. Cerci large, rounded apically, densely setose (not figured).

Female. Body length: 1.8–3.0 mm. Head: Scape and pedicel subequal in size, 10 neckless flagellomeres, apical flagellomere long, slightly constricted, fourth flagellomere slightly longer than wide, barrel-shaped, with 1 whorl of short setae basally, numerous short hair-shaped translucent sensilla on apical half (Fig. 39). Sensilla on flagellomeres 1–5(–6) partially in pits (Fig. 39). Legs: Pretarsal claws toothless. Preabdomen: Posterior tergites

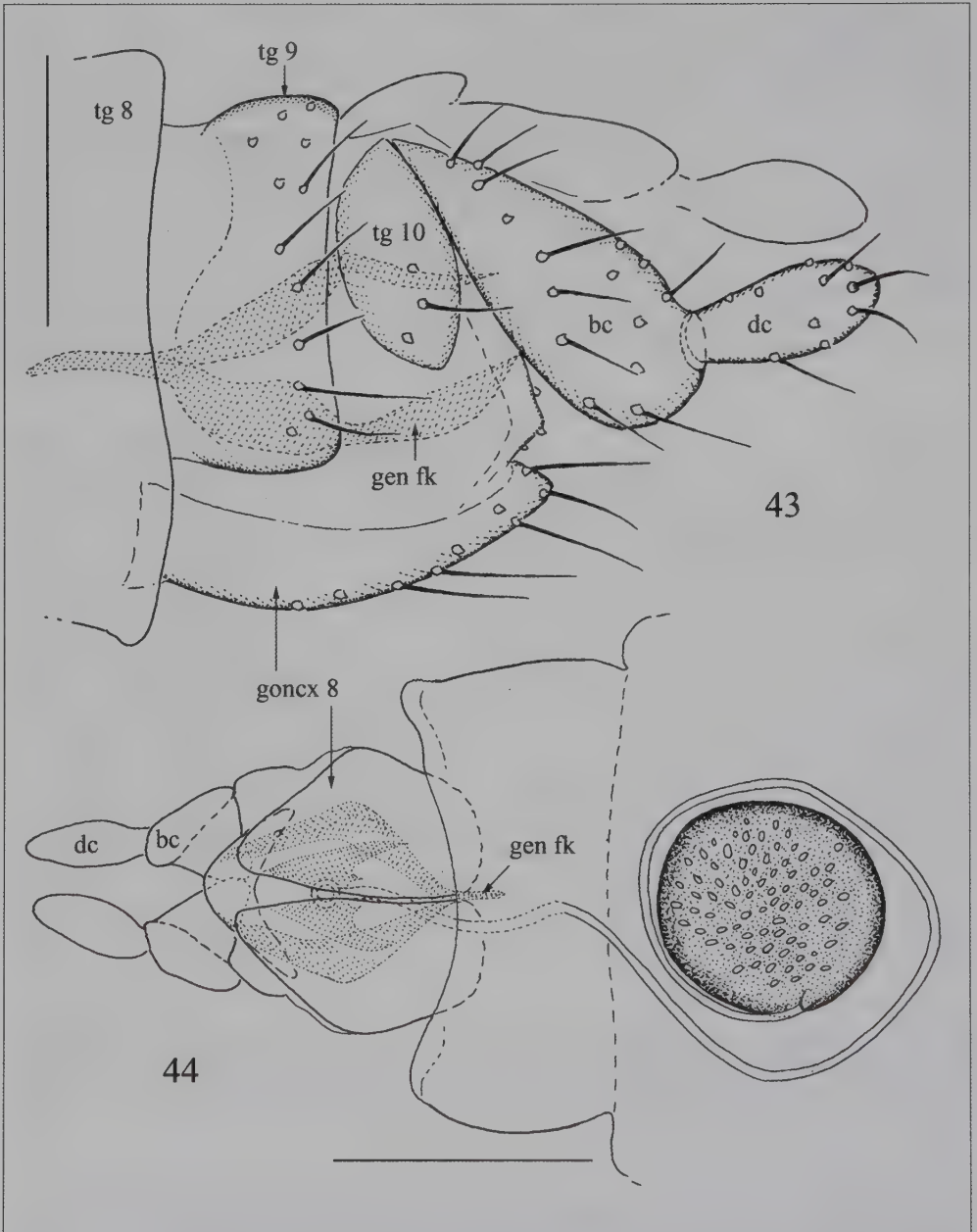


Figures 38–42. *Mangogrostix orientalis* (Grover). 38: Male wing, dorsal view; 39: Female flagellomeres 3–5, lateral view; 40: Male fourth flagellomere, lateral view; 41: Male terminalia, dorsal parts omitted, ventral view; 42: Ejaculatory apodeme and parameres, ventral view. Scale = 0.25 mm (for 38) and 0.05 mm (for 39–42).

without strongly sclerotised hind margins. Other characters as in male. Terminalia: 1 large discoid sclerotised spermatheca, surface with innumerable tiny membranous plaques (Fig. 44). Basicercus elongated ventroposteriorly, larger than disticercus (Fig. 43).

Remark on phenology: Specimens in the UAE were collected exclusively between June and September, which are the hottest and driest months in this region.

Distribution: As for the genus.



Figures 43–44. Female terminalia of *Mangogrostix orientalis* (Grover). 43: Dorsolateral view; 44: Ventral view. Scale = 0.1mm. Abbreviations: bc, basicercus; dc, disticercus; gen fk, genital fork; goncx 8, gonocoxite 8; tg 8–10, tergites 8–10.

Genus *Wasmanniella* Kieffer, 1898

Diagnosis: *Wasmanniella* adults are small, less than 1.5 mm long; their eye bridge is devoid of facets dorsally; their anterior wing veins are shortened; and setae on both wing membrane and veins are sparse. The females of 2 of the known species are apterous. Male genitalic characters include the short gonocoxites, simple elongate gonostyli with an apical spine, the simple tegmen, and the poorly sclerotised ejaculatory apodeme.

Distribution: There are 3 named species known from the Holarctic and Oriental Regions. In addition we know of quite a number of unnamed species from Central America, the East Palaearctic, Malaysia, and tropical Africa.

Wasmanniella ?indica Grover, 1970

Figures 45–51

Slide-mounted specimens examined: Khor Kalba (tunnel), 1♂, 4–11.iv.2006, LT. Khor Khwair, 1♂, 15–22.iii.2007, LT. Wadi Bih, 2♂, 24.iv–1.v.2007, LT. Wadi Madaq, 1♂, 7–14.iii.2006, WT. Wadi Safad, 2♂, 2♀, 25.iii–1.iv.2006; 1♂, 20.v–17.vi.2006; all LT.

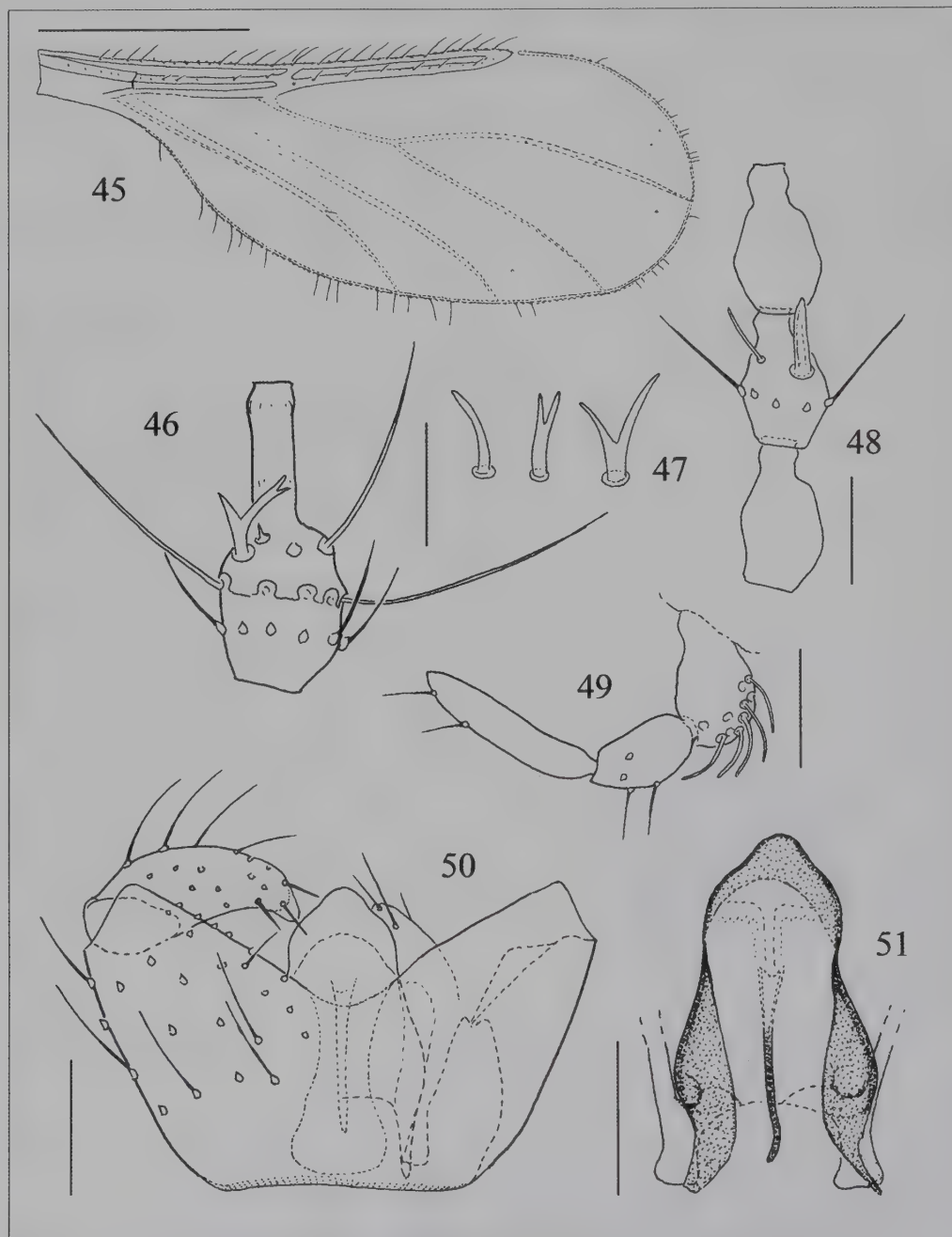
Diagnosis: Males of *W. indica* can be recognized by the following characters in combination. The antennal translucent sensilla may be furcate or branched, and 1–3-pointed (Figs 46–47); the palpi are 3-segmented, the apical segment is long, not constricted (Fig. 49); the setae on both wing membrane and veins are sparse (Fig. 45); the tegmen has a sclerotised portion apically and its apical margin is narrowly rounded (Fig. 51). Females of *W. indica* are fully winged, not apterous as in other *Wasmanniella* spp.

Supplement to the description by Grover (1970): Male. Body length: 1.1–1.3 mm. Head: Translucent hair-shaped sensilla on basal palpal segment long; apical palpal segment longer than preceding segment, its absolute length variable (Fig. 49). Neck of fourth flagellomere slightly shorter than node (Fig. 46). Outline of antennal translucent sensilla variable (Fig. 47). Wing (Fig. 45): Setae on membrane few in number, numbers varying among specimens, mainly confined to peripheral area apically, dorsal setae on basR1, R5, M1 and occasionally CuA2, ventral setae on R5 apically. Legs: Pretarsal claws slightly curved, with 1 very fine tooth at midlength. Preabdomen: Tergites 1–8 and sternites 2–8 with sparse, moderately long setae. Terminalia: Tg 9 with broadly rounded apical margin, 1 row of setae along margin (not figured). Ventral bridge of gonocoxites membranous, aetose (Fig. 50). Gonostyli evenly tapered towards apex, with fingernail-like spine apically and 4 bristles sub-apically (Fig. 50). Tegmen moderately sclerotised, slightly constricted on apical half, narrowly rounded apically, basolateral margins curved medially (Fig. 51). Ejaculatory apodeme very thin, membranous apically (Fig. 51).

Female. Body length: 1.3 mm. Head: Postfrons with 2 setae in one of the specimens. 10 flagellomeres with distinct necks, fourth flagellomere with 1 whorl of setae sub-basally, 2 translucent sensilla distally similar to those in males, but thicker (Fig. 48). Other characters as in male. Terminalia: 1 large circular unsclerotised spermatheca.

Remarks on identification: We assign our specimens tentatively to *W. indica*, as they largely fit the species description by Grover (1970). She describes the wings as being covered with macrotrichia (here called setae), which is not correct with regard to our specimens. Her figures of the male terminalia (Pl. 4, Figs 7A, 7B) do not show much detail and thus are useless for distinguishing among *Wasmanniella* species, which are extremely similar to one another.

Distribution: Oriental Region: Uttar Pradesh, India (Grover 1970). Palaearctic Region: UAE (this work).



Figures 45–51. *Wasmanniella ?indica* Grover. 45: Male wing, dorsal view; 46: Fourth flagellomere of male, microrichia omitted, lateral view; 47: Variation in antennal sensilla of male; 48: Female flagellomeres 3–5, lateral view; 49: Male palpus, medial view; 50: Male terminalia, ventral view; 51: Ejaculatory apodeme and tegmen, ventral view. Scale = 0.25 mm (for 45) and 0.05 mm (for 46–51).

Subfamily Micromyinae

This subfamily comprises more than 40 genera and almost 550 species. Representatives of 2 of the 9 micromyine tribes were found to occur in the UAE, 1 species of Aprionini and 2 species of Micromyini. The paucity of Micromyinae in the Emirates is not surprising, considering that most species live in association with rotten wood of large dimension. Even so, several pedobiont groups that have been found in dry environments on other occasions are likely to occur in the region in question, such as the genera *Campylomyza* Meigen, 1818 (in Campylomyzini) and *Polyardis* Pritchard, 1947 (in Micromyini). The wing venation as typical of Micromyinae is shown in Figure 52.

Tribe Aprionini

Three of the four genera of Aprionini are either monotypic or species-poor, whereas the genus *Aprionus* Kieffer comprises 111 extant species, making it the second largest genus of the subfamily Micromyinae. None of these genera occurs in the UAE. The only aprionine species found there has been originally described as an *Aprionus* Kieffer, 1894, from India and is here assigned to a new genus, *Tropaprionus*.

Genus *Tropaprionus* Jaschhof & Jaschhof **nov. gen.**

Type species: *Aprionus indicus* Jaiswal, 1988.

Other species included, all transferred from *Aprionus*: *Tropaprionus aciculatus* (Mamaev, 1997) **nov. comb.**; *T. binarius* (Mamaev, 1998) **nov. comb.**; *T. congenericus* (Mamaev, 1998) **nov. comb.**; *T. ellipticus* (Mamaev, 1997) **nov. comb.**; *T. kivachensis* (Jaschhof, 2009) **nov. comb.**; and *T. plicatus* (Fedotova, 2004) **nov. comb.**

Diagnosis: This new genus differs from *Aprionus* in the male genitalic structures. The tegmen lacks finger-like processes, which are present in most *Aprionus* spp. Sternite 10 is usually absent, or present as a weakly membranous double lobe, whereas it typically forms a sclerotised asetose plate, called the subanal plate, in *Aprionus* spp. The gonostyli are one-lobed, strongly flattened, often emarginated medially, and with spines apically and bristles sub-apically, which is a character combination rarely met in *Aprionus* spp. Tergite 9 is typically V-shaped, with 1 or 2 projections on apical margin, whereas it is usually subrectangular and without apical modifications in *Aprionus*. There are a few *Aprionus* species that display one or two of the characters regarded here as diagnostic of *Tropaprionus*, but none that show all these characters in combination. No single derived character unique to *Tropaprionus* is known.

Relationship: We suggest *Tropaprionus* and *Aprionus* are sister groups, a suspicion supported by adult morphology which largely corresponds in these two genera. We believe that *Tropaprionus* never possessed either tegmen fingers or subanal plate, which are regarded as novel structures of *Aprionus*. The structure of both the gonostyli and tergite 9 in *Tropaprionus* is in a derived state, which gives further support to the generic autonomy.

Distribution: Most of the species that are here assigned to *Tropaprionus* have been described from the Far East of Russia, one species (*T. kivachensis*) is from northern Europe. The type species has a wide geographic distribution in the southern Old World (see below). We know of numerous unnamed *Tropaprionus* species from the tropics and subtropics round the world, and it is likely that the warm zone on both sides of the equator is the distributional centre of this genus.

Etymology: The generic name is composed of *tropical* and *Aprionus*, meaning, in a figurative sense, “thermophile *Aprionus*”.

***Tropaprionus indicus* (Jaiswal, 1988) nov. comb.**

Figures 52–58

Slide-mounted specimens examined: UAE, unknown locality and date, 14♂, 6♀, leg. A. van Harten.

Remark on identification: We identified our specimens on the basis of Jaiswal's (1988) description. He figured not every detail of the male genitalia correctly, but the characteristic outline of the ninth tergite, the gonostyli, and the tegmen are adequately shown (Jaiswal, 1988: Figs 10, a, b). We gained further confidence in our identification by the finding that *T. indicus* is widely distributed in the Afrotropics (see below), a fact making it more plausible that this species should occur in regions as distant from one another as the Arabian Peninsula and India.

Diagnosis: The gonostylus in ventral view is elongate and pointed apically (Fig. 56), while the posterior view reveals its strongly flattened, almost quadrate shape (Fig. 55). The apical margin is incised medially and bears ventrally an inconspicuous fingernail-like spine. There are numerous large setae on the basal third, which is swollen, and much smaller setae on the apical two thirds. The tegmen is tapered towards the apex, which is slightly concave; the lateral margins are strongly sclerotised and seem at first glance to be two separate columns (Fig. 57). Tergite 9 is shaped like an inverted V and is pointed to truncate apically, depending on how the apex is fixed under the cover slip (Fig. 58).

Supplement to the description by Jaiswal (1988). The number of ocelli is 3, not 2. All the 3 segments of the palpus bear hair-shaped translucent sensilla, being numerous on the basal segment and much fewer in number on the distal segments. The antennae of males have simple hair-shaped translucent sensilla (Fig. 54). Vein apicR1 is slightly longer than Rs; M1+2 is long, occasionally extending to the costa (Fig. 52). The gonocoxal apodemes are very broad; the dorsal transverse bridge of gonocoxites has a strongly sclerotised rib medially; and the cerci are distinct and pubescent (Fig. 57). Females have 10–12 pear-shaped flagellomeres, each bearing 4 thick, often curved, occasionally two-pointed translucent sensilla (Fig. 53). The single ovoid spermatheca is slightly sclerotised. The structure of the long telescopic ovipositor is like that in *Aprionus* spp.

Distribution: Oriental Region: India (Jaiswal, 1988). Palaearctic Region: UAE (this work). Afrotropical Region: Togo, Madagascar (Jaschhof, unpublished).

Tribe Micromyini

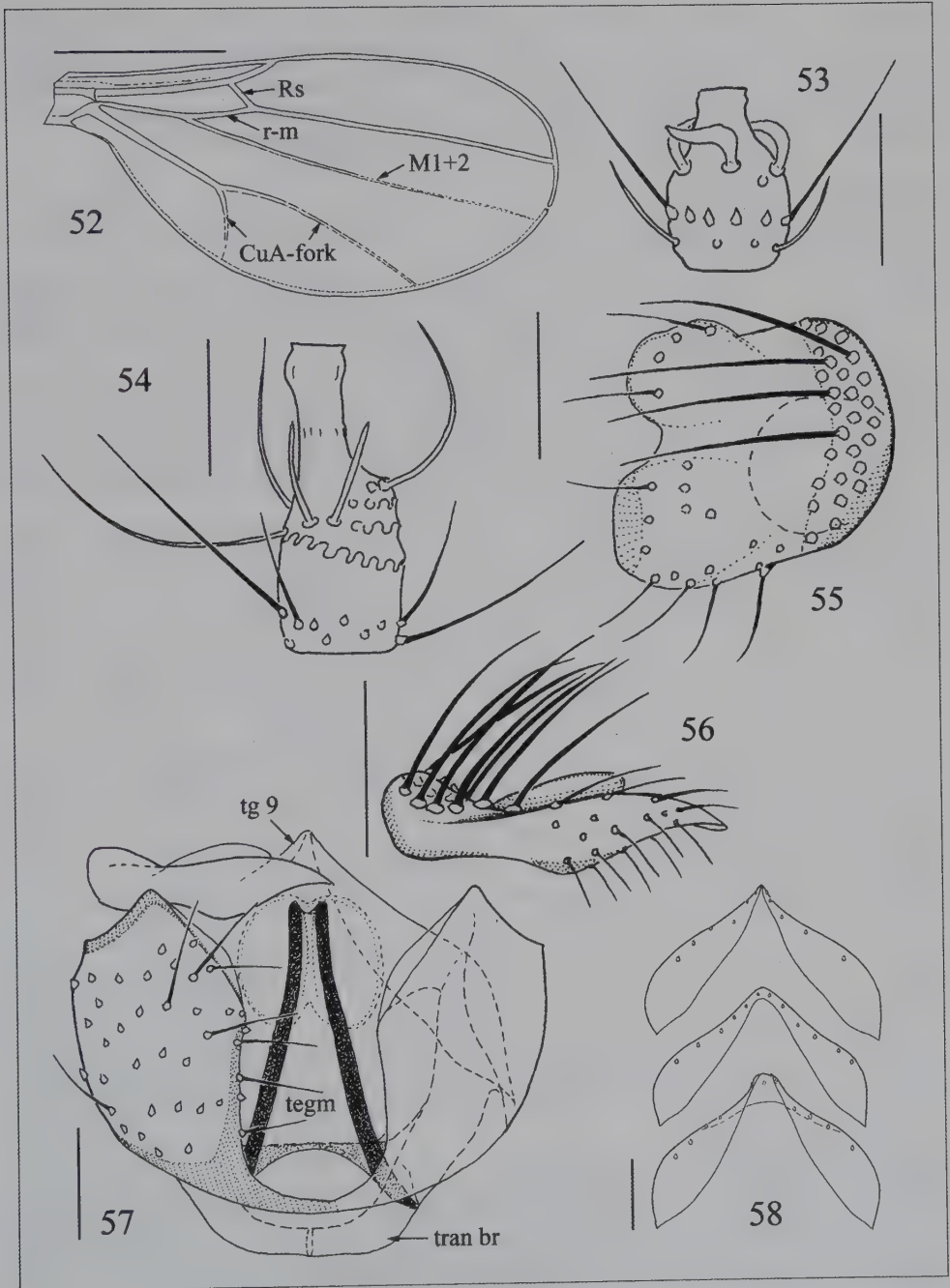
This tribe comprises 5 genera (one with four subgenera) and slightly more than 100 species. We found 2 species to be present in the Emirates, one each of the genera *Micromya* Rondani and *Monardia* (*Xylopriona*) Kieffer. Species of *Micromya* are remarkable for their swarming habit.

Genus *Micromya* Rondani, 1840

Diagnosis: Males are unmistakably characterized by the short antennae with very large globular pedicels and maximally 9 flagellomeres, which lack both necks and crenulate whorls of sensory hairs. The crescent-shaped pretarsal claws are larger than usual in Micromyinae. In females the pedicel and claws are less enlarged; the antenna has 7–10 (usually 9) flagellomeres; the translucent sensilla are multiporous, incompletely collar-shaped; and the single spermatheca is large, sclerotised and thin-discoïd. Wings are short and wide; vein apicR1 is very short, nearly as short as Rs.

Distribution: Almost cosmopolitan, only absent in the Australasian Region.

Remarks on species identification: Nine of the 11 named species have been described from China and India (see species list in Gagné, 2004). Much of their descriptions is morphometric



Figures 52–58. *Tropaprionus indicus* (Jaiswal) nov. comb. 52: Male wing, setae omitted, dorsal view; 53: Fourth flagellomere of female, lateral view; 54: Fourth flagellomere of male, lateral view; 55: Gonostylus, posterior view; 56: Gonostylus, ventral view; 57: Male terminalia, ventral view; 58: Variation in male tergite 9, dorsal view. Scale = 0.250 mm (for 52) and 0.025 mm (for 53–58). Abbreviations: tegm, tegmen; tg 9, tergite 9; tran br, transverse bridge.

data, which is problematic insofar as measurements were taken from only a very few specimens, often singletons. As a consequence, characters used by the describing authors to differentiate between species seem little reliable to us. Intraspecific variation in *Micromya lucorum* Rondani, 1840, which is a widespread Holarctic species, has been demonstrated and discussed by Jaschhof (1998: 242ff.) and Jaschhof & Jaschhof (2009: 194).

***Micromya ?transispina* Mo, 1990**

Figures 59–63

Slide-mounted specimens examined: Hatta, 2♂, 2♀, 4–11.iv.2006, LT. Wadi Madaq, 10♂, 10♀, 20.i–3.ii.2008, WT. Wadi Wurayah, 5♂, 3♀, 23.ii–2.iii.2009, LT.

Specimens seen in ethanol: Bithnah, 2.ii–2.iii.2006; 26.v–11.vi.2006, all LT. Hatta, 30.i–26.ii.2006, 2.ii–2.iii.2006, 31.v–14.vi.2006, 19.vii–30.viii.2006, all LT. Khor Kalba (tunnel), 31.i–21.ii.2006, 4–11.iv.2006, all LT. Wadi Madaq, 3–17.ii.2008, WT. Wadi Safad, 25.iii–1.iv.2006, 20.v–17.vi.2006, 22.vii–9.ix.2006, all LT. Wadi Wurayah, 15.i–2.iii.2009, LT.

Remarks on identification: The only *Micromya* species present in the UAE is definitely not *Micromya lucorum*. Our specimens fit best the description of *Micromya transispina* from Jilin Province, northeast China (Mo, 1990). *Micromya longispina* Mo, 1990, may be a synonym. Whether or not *M. transispina* is identical with one of the Indian *Micromya* species cannot be decided on the basis of the literature available.

Diagnosis: The antennae of males have 8 or 9 flagellomeres, depending on whether or not the 2 apical flagellomeres are fused (Figs 60–61). The second palpal segment is very slender and longer than the first and third segments (Figs 62–63). The gonostyli are slightly more robust compared with those in *M. lucorum* and *M. kyushuensis* Yukawa, 1967, and have a moderately large spine apically (Fig. 59). Females of *M. transispina*, which are here reported on for the first time, cannot be distinguished from females of other *Micromya* spp. All our specimens (n=13) have 9 flagellomeres, the apical one is constricted.

Intraspecific variation: Most of our male specimens (n=17) have 8 flagellomeres. One and the same specimen may have 8 and 9 flagellomeres on either side. The length of the second palpal segment relative to the third segment is variable (Figs 62–63). The outline of the translucent sensilla on the male first to third flagellomeres varies from leaf- to hair-shaped and therefore is not an acceptable character for distinguishing between species.

Distribution: Palaearctic Region: China (Mo, 1990), UAE (this work).

Genus *Monardia* Kieffer 1895, subgenus *Xylopriona* Kieffer, 1913

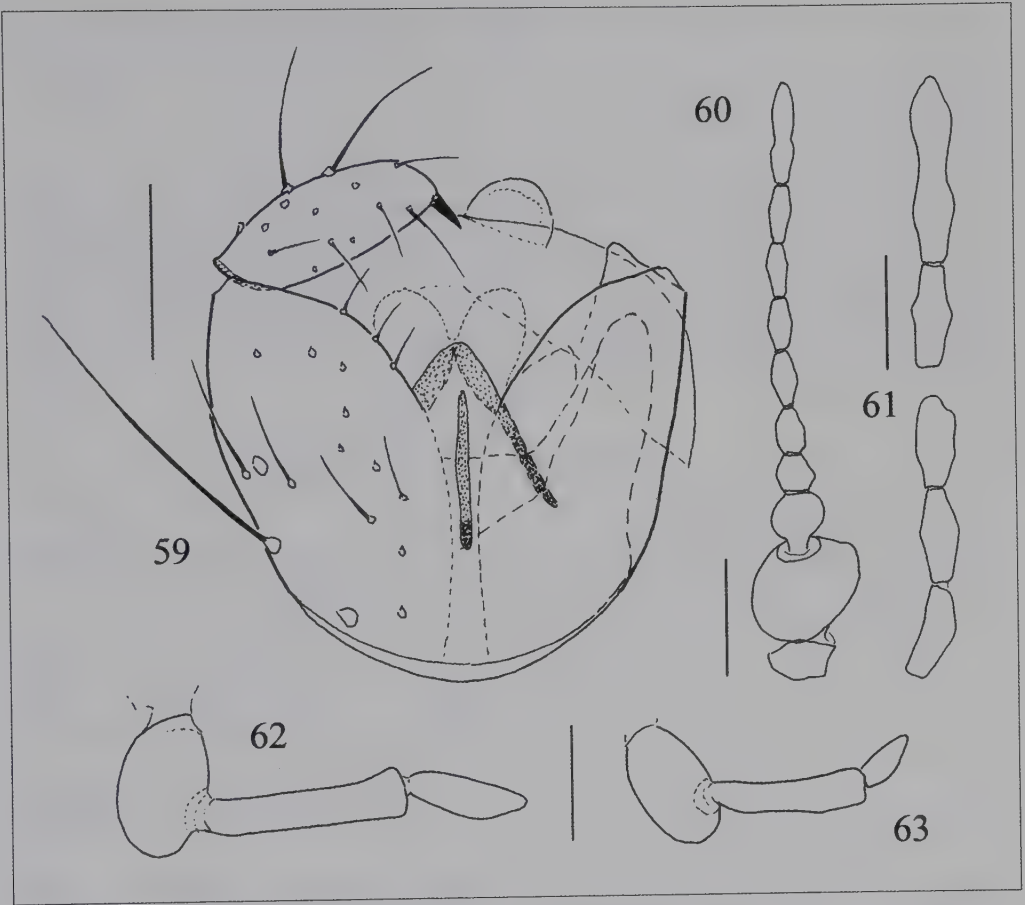
Diagnosis: The genus *Monardia* includes Micromyini with leaf-shaped or furcate antennal sensilla in both sexes. Male flagellomeres, which usually number 12, are barrel-shaped and have crenulate whorls of sensory hairs. Female flagellomeres, of which the number ranges from 9 to 35, have well developed necks and thus appear pear-shaped. The number of spermathecae is almost always 2. *Monardia* spp. with well developed empodia are classified in the subgenus *Xylopriona*.

Distribution: Cosmopolitan.

Remarks on classification: The present subgeneric classification of *Monardia* is largely based on the Holarctic species, ignoring the wealth of world Micromyini not yet described and named, and thus is preliminary (see Jaschhof & Jaschhof, 2009: 195). The subgenus *Xylopriona* in its present definition is certainly not a monophyletic group.

***Monardia (Xylopriona) toxicodendri* (Felt, 1907)**

Slide-mounted specimens examined: Bithnah, 4♂, 4♀, 16.ii.2009, by aspirator, leg. M. Jaschhof. Hatta, 7♂, 30.i–26.ii.2006; 2♀, 4–11.iv.2006; all LT. Khor Kalba (tunnel), 1♂, 16–31.i.2006, LT. Khor al-Khwair, 1♂, 22.ii–1.iii.2007, LT. Wadi Safad, 1♀, 27.xi–22.xii.2005, LT; 1♂, 2–26.i.2006, WT, 1♂, 7–14.iii.2006, WT. Wadi Wurayah, 1♂, 18–25.iii.2007, Malaise trap.



Figures 59–63. *Micromyza* ?*transispina* Mo, male. 59: Terminalia, ventral view; 60: Antenna, lateral view; 61: Variation in outline of antenna apex, lateral view; 62: Palpus, lateral view; 63: Ditto. Scale = 0.025 mm (for 59, 61–63) and 0.050 mm (for 60).

Specimens seen in ethanol: Al-Ajban, 2–9.iv.2006, LT. Bithnah, 2.ii–2.iii.2006, LT. Hatta, 30.i–26.ii.2006; 19.vii–16.viii.2006; all LT. Khor Kalba (tunnel), 31.i–21.ii.2006, LT. Sharjah Desert Park, 31.i–12.ii.2009, LT. Wadi Bih, 19.ii–1.iii.2008, LT. Wadi Madaq, 17–24.v.2006, LT. Wadi Safad, 25.iii–1.iv.2006, LT. Wadi Wurayah, 15.i–22.ii.2009, LT.

Diagnosis: *Xylopriona toxicodendri* is one of 3 species in which the gonostyli bear a very large curved spine apically or sub-apically. Within this so-called *toxicodendri* group the name-giving species is the most common and widespread one. It has 3-segmented palpi and male flagellomeres in which the necks are shorter than the nodes. In *Xylopriona truncata* Jaschhof the necks of the male flagellomeres are much longer than the nodes. In *Xylopriona unguifera* Berest & Mamaev the palpi are 4-segmented. Other interspecific differences concern the male genitalia (see Jaschhof & Jaschhof 2009: 213ff.). In the UAE, the females of *Xylopriona toxicodendri* and *Micromyza* ?*transispina* are superficially similar, as the number of flagellomeres in both species is 9, but *Xylopriona* has 2 spermathecae and *Micromyza* only 1 spermatheca.

Distribution: Palearctic, Nearctic and Neotropical Regions (Jaschhof & Jaschhof 2009). UAE (this work).

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Authors addresses:

Dr Mathias Jaschhof, Senckenberg Deutsches Entomologisches Institut, Eberswalder Strasse 90, D-15374 Müncheberg, Germany; e-mail mathias.jaschhof@senckenberg.de.
Catrin Jaschhof, Thälmann-Ring 64, D-17491 Greifswald, Germany; e-mail cjaschhof@yahoo.de.

Order Diptera, family Limoniidae

E. Geoffrey Hancock

INTRODUCTION

The insects treated here belong to the family Limoniidae of the Tipuloidea, commonly called short-palped craneflies in vernacular English. They are characterised within the nematocerous Diptera by the possession of two anal veins reaching the wing margin and a v-shaped suture completely transversing the dorsum. Limoniidae are slender flies with elongate wings and abdomen, usually small to tiny (in the Arabian species body length is from 4–12 mm). They have short palps, the terminal segments of which are only slightly longer than the others. The antennae are normally of 16 apparent segments with two basal segments, the scape and pedicel, plus the filiform flagellum divided into 14 flagellomeres. The system of higher classification and nomenclature adopted here is that of Soós et al. (1992).

MATERIALS AND METHODS

The principal localities of the samples from the United Arab Emirates mainly obtained using light or Malaise traps, with their coordinates, are as follows: Ad-Dhaid 25°09'N 55°48'E; al-Ajban 24°36'N 55°01'E; Bithnah 25°10'N 56°14'E; Fujairah 25°08'N 56°21'E; Hatta 24°49'N 56°07'E; Khor al-Khwair 25°57'N 56°03'E; Sharjah Desert Park 25°17'N 55°42'E; Wadi Madaq 25°10'N 56°14'E; Wadi Safad 25°13'N 56°19'E; Wadi Wurayah 25°24'N 56°17'E.

The specimens were all preserved in alcohol but some have been pinned or card-mounted and a few are now on microscope slides. All are currently retained at the Hunterian Museum (Zoology), Entry Number 830; examples will be made available to the UAE Invertebrate Collection and to other institutions.

Abbreviations used: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap; WT = water traps. If not otherwise stated, the specimens were collected by Antonius van Harten.

SYSTEMATIC ACCOUNT

Subfamily **Hexatominae** Hendel & Beier, 1938

Tribe **Hexatomini** Alexander, 1920

Hexatoma (Eriocera) omanensis Hancock, 1997

Plate 1

Specimens examined: Wadi Safad, 1♂, 25.ii.2007, sitting under a rock niche, leg. A. Stark.

Distribution: Apart from Oman, from where this species was described, this is the only other known location for this species.

Subfamily **Eriopterinae** van der Wulp, 1877

Tribe **Eriopterini** Scudder, 1894

***Styringomyia ebejeri* Hancock, 1997**

Plate 2

Specimens examined: Al-Ajban, 2♀, 10–17.x.2005, LT & MT; 1♂, 5♀, 17.x–9.xi.2005, LT; 1♂, 1♀, 9.xi–7.xii.2005, LT & MT; 1♀, 14–21.xii.2005, LT & MT; 1♂, 3♀, 7–28.xii.2005, LT & MT; 3♂, 2♀, 25.ii–19.iii.2006, MT; 2♀, 26.ii–2.iv.2006, MT; 5♂, 9♀, 6–22.v.2006, LT; 1♂, 3♀, 26.vi–25.vii.2006, MT. Bithnah, 6♀, 31.xii.2005–5.ii.2006, LT. SW of ad-Dhaid, 1♂, 10–29.xii.2005, LT. Fujairah, 1♂, 2♀, 16–24.ii.2005; 1♂, 3♀, 24.ii–5.iii.2005; 11♀, 5–24.iii.2005; 3♂, 4♀, 5.iii–6.iv.2005; 2♂, 11♀, 2.v–5.vi.2005; 1♂, 2♀, 5.vi–2.vii.2005; 2♂, 11♀, 13–29.xi.2005; 7♂, 19♀, 8.xii.2005–2.i.2006; 17♂, 22♀, 2–30.i.2006; 6♂, 17♀, 28.ii–21.iii.2006; 9♂, 26♀, 15–22.iv.2006; all LT. Hatta, 1♂, 22.i–5.ii.2006; 1♂, 11♀, 19–28.ii.2006; 2♂, 8–26.iv.2006; all LT. Sharjah Desert Park, 1♀, 14.x.2004, at light; 5♀, 4♂, 25.i–22.ii.2005; 1♂, 1♀, 22.ii–9.iii.2005; 5♂, 12♀, 21–29.iii.2005; 30♂, 35♀, 6–30.iv.2005; 28♂, 39♀, 30.iv–31.v.2005; 12♂, 8♀, 31.v–30.vi.2005; 1♂, 4♀, 30.vi–21.7.2007; 1♀, 21.vii–5.viii.2005; 4♂, 4♀, 20.x–8.xi.2005; 1♂, 5♀, 13.xi–11.xii.2005; 2♂, 7♀, 11.xii.2005–18.i.2006; 1♂, 16–31.i.2006; all LT. Sharjah-Khor Kalba, near tunnel, 1♂, 11♀, 7–22.iii.2006, LT. NARC, near Sweihan, 1♂, 1♀, 14.iii–2.iv.2005; 3♂, 13♀, 2–30.iv.2005; 4♂, 2♀, 26.ii–2.iv.2006; all LT. Wadi Madaq, 1♂, 1♀, 27.xi–21.xii.2005; 1♂, 21.xii.2005–5.ii.2006; 3♀, 2–16.ii.2006; all LT.

Distribution: The species was described by Hancock (1997) from three males from Oman and one male from the UAE (Jumeirah). No further records are known.

***Symplecta hybrida* (Meigen, 1804)**

Plate 3

Specimens examined: Al-Ajban, 1♂, 26.ii–2.iv.2006, MT. Hatta, 1♀, 19–28.ii.2006, LT. Wadi Madaq, 1♂, 27.xi–21.xii.2005; 1♂, 21.xii.2005–5.ii.2006; all LT. Wadi Safad, 1♂, 7–22.03.2006, LT.

Distribution: A Palearctic species, occurring as far north as Finland. Known from Iran (Alexander, 1975). This is the first record from the Arabian Peninsula.

Tribe *Gonomyiini* Savchenko & Krivolutskaya, 1976***Gonomyia (Leiponeura) saudiarabiensis* Hancock, 1997**

Plate 4

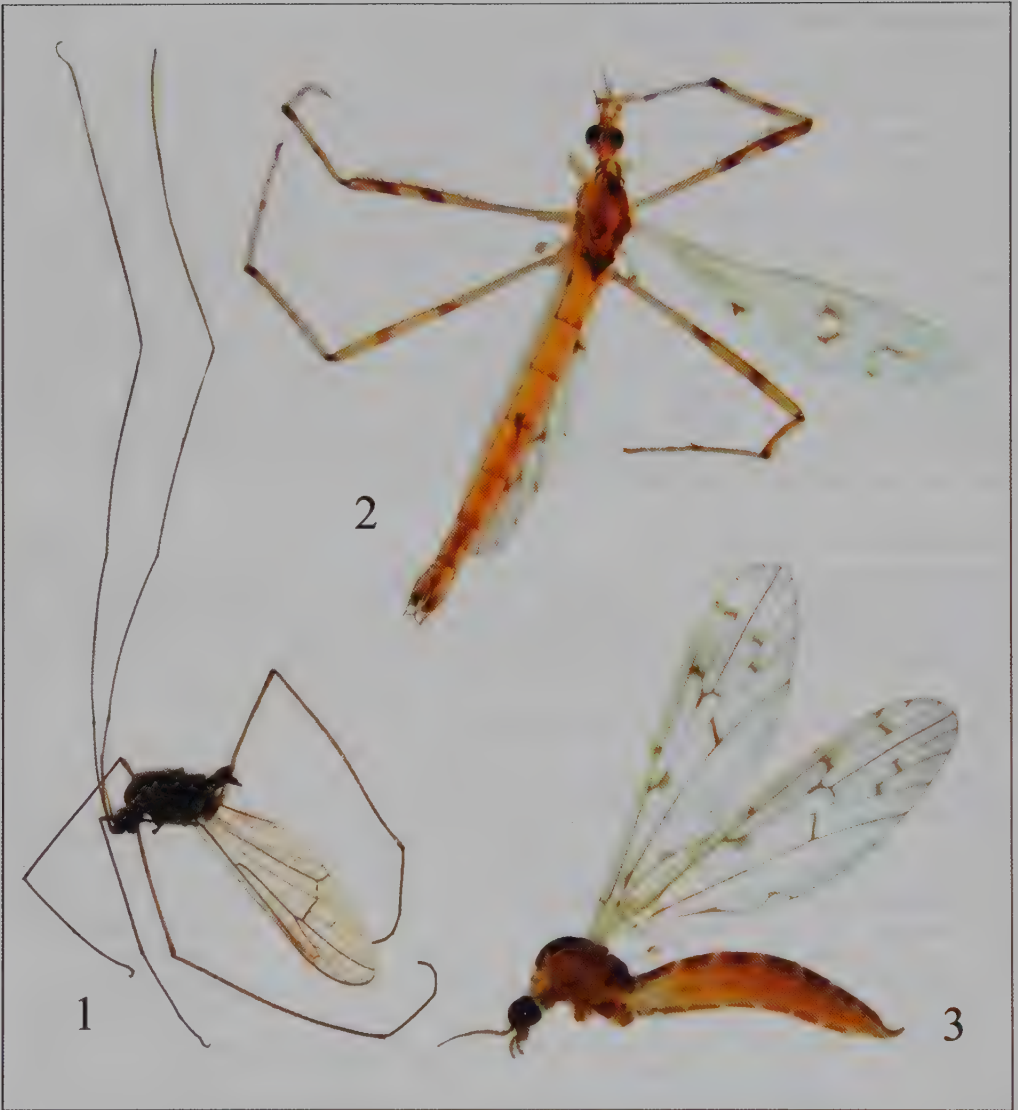
Specimens examined: Al-Ajban, 4♀, 4♂, 10–17.x.2005, LT & MT; 2♂, 9–16.xi.2005, LT & MT; 42♂, 25♀, 9.xi–7.xii.2005, LT & MT; 10♂, 11♀, 7–28.xii.2005, LT & MT; 7♂, 3♀, 14–21.xii.2005, LT & MT; 3♀, 2♂, 28.xii.2005–29.i.2006, LT & MT; 24♂, 31♀, 25.ii–27.iii.2006, LT; 1♂, 9♀, 26.ii–2.iv.2006, MT; 5♂, 11♀, 27.v–26.vi.2006, MT; 8♂, 8♀, 12–19.vi.2006, MT; 11♂, 19♀, 19–26.vi.2006, MT. Bithnah, 7♂, 5♀, 31.xii.2005–2.ii.2006, LT. SW of ad-Dhaid, 2♀, 10–29.xii.2005; 1♀, 29.xii.2005–7.ii.2006; all LT. Fujairah, 1♀, 2.v–5.vi.2005; 19♂, 14♀, 17.x–9.xi.2005; 1♀, 15–22.iv.2006; all LT. Sharjah Desert Park, 1♂, 1♀, 10.xi.2004, at light; 3♂, 1♀, 18–25.i.2005; 23♂, 11♀, 25.i–22.ii.2006; 1♂, 1♀, 22.ii–9.iii.2005; 15♂, 2♀, 21–29.iii.2005; 13♂, 2♀, 29.iii–6.iv.2005; 23♂, 6♀, 30.iv–31.v.2005; 16♂, 8♀, 31.v–30.vi.2005; 19♂, 2♀, 30.vi–21.vii.2005; 3♂, 1♀, 21.vii–5.viii.2005; 97♂, 15♀, 20.x–8.xi.2005; 45♂, 7♀, 13.xi–11.xii.2005; 80♂, 9♀, 11.xii.2005–18.i.2006; 39♂, 12♀, 6–30.iv.2006; 1♂, 2♀, 26.vi–25.vii.2006; all LT. Sharjah-Khor Kalba, near tunnel, 1♂, 16–31.i.2006; 1♂, 1♀, 7–22.iii.2006; all LT. Wadi Madaq, 1♀, 27.xi–21.xii.2005; 1♂, 1♀, 21.xii.2005–2.ii.2006; all LT. Wadi Safad, 1♀, 2–26.i.2006, WT.

Distribution: Described by Hancock (1997) from Oman (type-locality: Mintirib Oasis) and Saudi Arabia. Hancock (2006) recorded some additional specimens from Oman. New to the UAE.

***Idiocera buettikeri* Hancock, 1997**

Plate 6

Specimens examined: Al-Ajban, 1♂, 7–28.xii.2005, LT & MT; 2♂, 25.ii–19.iii.2006, MT; 1♂, 12–19.vi.2006, MT; 2♂, 19–26.vi.2006, MT; 1♂, 21.viii–19.ix.2006, MT. Fujairah, 1♂, 2.v–5.vi.2005; 1♂, 28.ii–1.iv.2006; all LT. Shajah-Khor Kalba, near tunnel, 1♂, 7–22.iii.2006, LT. SW of ad-Dhaid, 1♂, 29.xi.2005–7.ii.2006, LT. NARC, near Sweihan, 1♂, 26.ii–2.iv.2006, LT. Wadi Madaq, 1♂, 27.iv–4.v.2006; 1♂, 1–8.vii.2006; all LT. Wadi Shawkah, 1♂, 31.x–27.xi.2006, WT.



Plates 1–3. 1: *Hexatoma (Eriocera) omanensis* Hancock, male, showing long antennae. Abdomen has been mounted separately in order to examine genitalia. Wing length 10.4 mm; 2: *Styringomyia ebejeri* Hancock, whole habitus, dorsal view of a male. Wing length 4.3 mm; 3: *Symplecta hybrida* (Meigen), alcohol preserved specimens of most small craneflies tend to lose their legs as with this species. Female specimen, wing length 6.4 mm.

Distribution: Described by Hancock (1997) from Oman (type locality: Mintirib Oasis) and Saudi Arabia. New to the UAE.

***Idiocera hofufensis* Hancock, 1997**

Specimens examined: Al-Ajban, 2♀, 25.ii–19.iii.2006; 2♂, 26.ii–2.iv.2006; 9♂, 2.vi–2.v.2006; 22♂, 16♀, 12–19.vi.2006; 18♂, 19♀, 27.v–26.vi.2006; 48♂, 37♀, 19–26.vi.2006; 99♂, 96♀, 26.vi–25.vii.2006; 15♂, 25.vii–21.viii.2006; 14♂, 21.viii–19.ix.2006; all MT. Hatta, 1♂, 19–28.iii.2006, LT. Wadi Madaq, 1♂, 24.ix–22.x.2006, WT.

Distribution: Until now only known from its type-locality in Saudi Arabia (Hofuf) and from Socotra (Hancock, 2010). New to the UAE.

***Idiocera lanciformis* Hancock, 1997**

Specimens examined: Fujairah, 1♂, 2–30.i.2006; 1♂, 28.ii–21.iii.2006; 2♂, 15–24.iv.2006; all LT.

Distribution: Only known from its type-locality in Oman (4 km W of Barka), this is only the second time the species has been recorded. New to the UAE.

***Idiocera (Idiocera) sziladyi* (Lackschewitz, 1940)**

Idiocera (Idiocera) sanaanensis Hancock, 2006 **nov. syn.**

Remarks: It has recently been pointed out to me (Staráý, pers. comm. 2009) that the genitalia of *Idiocera sanaanensis* Hancock, 2006, described from Yemen, closely resemble those of *sziladyi* Lackschewitz, 1940, and a comparison with the original description confirms this, making *sanaanensis* a junior synonym of the latter name.

Distribution: *I. sziladyi* is now known from the Canary Islands and across southern Europe and northern Africa to Israel and Yemen (Staráý & Freidberg, 2007).

Subfamily Limoniinae**Tribe Antochini Williston, 1896*****Orimarga arabica* Hancock **nov. spec.****

Plate 5, Figures 1–2

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Madaq, 25°10'N 56°14'E, 27.xi–21.xii.2005, light trap, leg. A. van Harten. Paratypes: 2♂, 3♀, Wadi Madaq, 27.xi–21.xii.2005; 6♂, 18♀, 2–16.ii.2006; 1♂, 2♀, 27.iv–4.v.2006; all LT. 4♂, 1♀, al-Ajban, 27.v–26.vi.2006, MT. 1♂, 3♀, SW of ad-Dhaid, 29.xii.2005–7.ii.2006, LT. 4♂, 4♀, Hatta, 8–26.iv.2006; 3♂, 3♀, 19–28.iii.2006; all LT. 3♂, 8♀, Sharjah-Khor Kalba, near tunnel, 16–30.i.2006; 6♂, 30♀, 7–22.iii.2006; all LT.

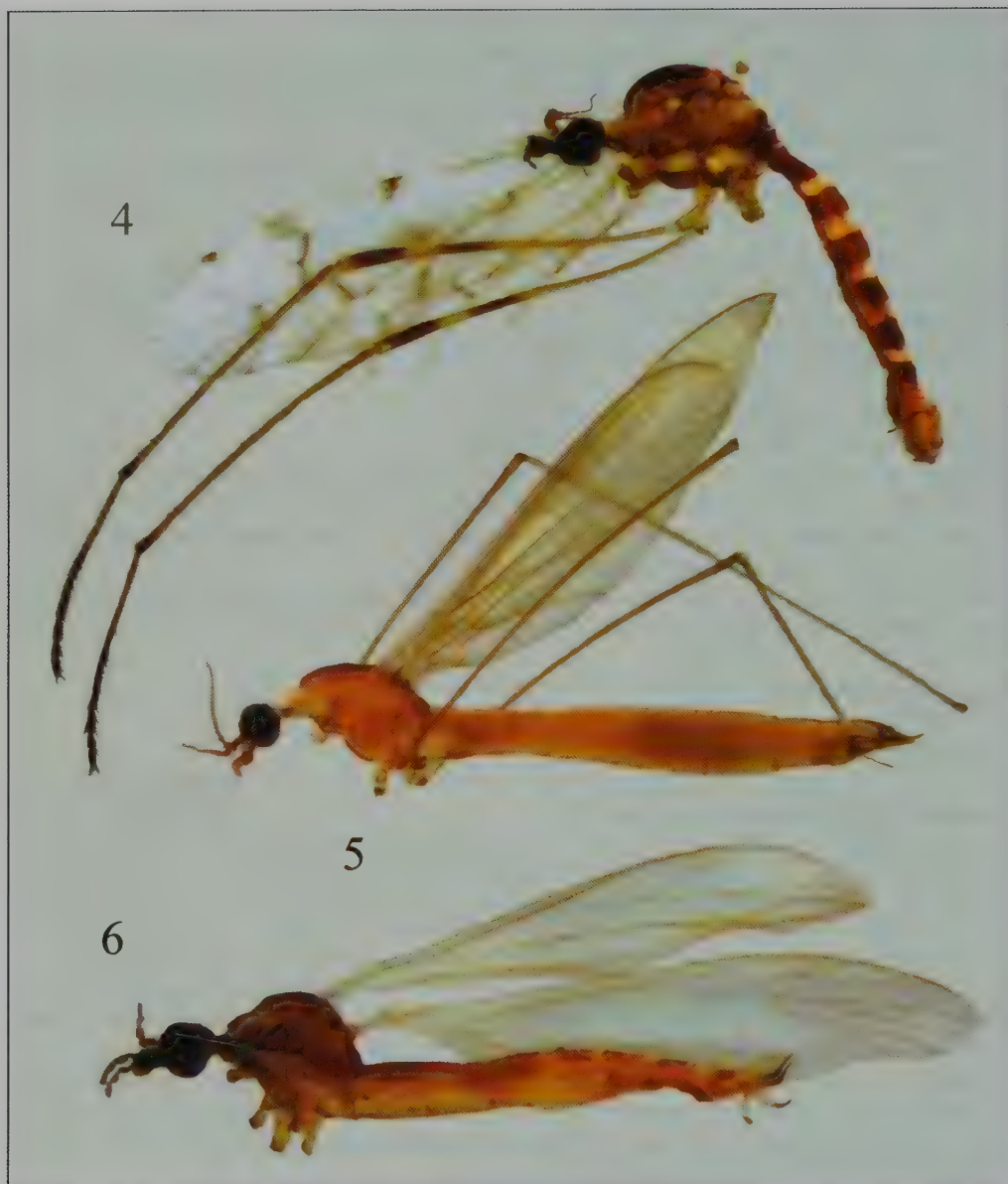
Diagnosis: A small, uniformly pale brown species with no apparent markings when seen in alcohol (Plate 6). Face and vertex mid-brown, thorax lighter and abdomen quite pale. When dried out the specimens seem very pale, almost white in parts, which may be due to fading. Wings clear, venation as in Figure 1. Average length of wings of males is 4.5 mm; females, 5.6 mm. The hypopygium is distinctive in that flat plates, tufted apically, subtend the forked arms of each paramere and elongated triangular apodemes support the aedeagal complex within the bases of the gonocoxites (Fig. 2).

Affinities: The general morphology is typical of the genus and the hypopygial characters are necessary to separate this species from others. Any relationships at this level have yet to be analysed.

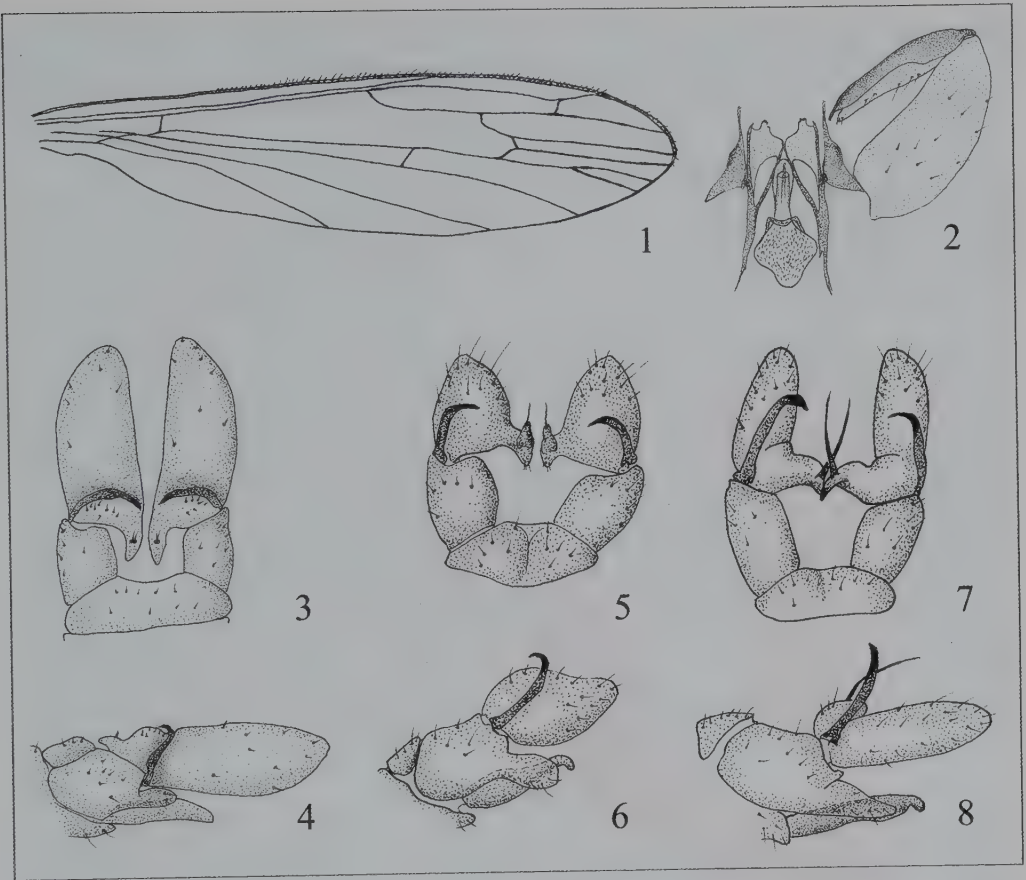
Tribe Limoniini***Geranomyia annandalei* Edwards, 1913.**

Plate 8, Figures 3–4

Specimens examined: Hatta, 1♂, 19–28.iii.2006, LT. Sharjah Desert Park, 1♂, 1♀, 29.iii–6.iv.2005; 3♂, 30.iv–31.v.2005, all LT. Sharjah-Khor Kalba, near tunnel, 1♀, 7–22.iii.2006, LT. Wadi Wurayah, 1♂, 22.i.2006, WT, leg. C. Tourenq.



Plates 4–6. 4: *Gonomyia (Leiponeura) saudiarabiensis* Hancock, showing banded femora, pale stripe across pleurae and banded abdomen. Male specimen, wing length 4.2 mm; 5: *Orimarga arabica* Hancock nov. spec., small pale brown species without obvious wing markings. Female specimen, wing length 5.5 mm. Legs digitally omitted; 6: *Idiocera buettikeri* Hancock, showing the long dististyles at the apex of the male abdomen. Wing length 4.8 mm.



Figures 1-8. 1-2. *Orimarga arabica* Hancock nov. spec. 1: Wing; 2: Hypopygium (dorsal view), only the left gonostyle is shown. 3-4. *Geranomyia annandalei* Edwards. Genitalia showing two short spines close together on inner rostrum of gonostyle. 3: Dorsal view; 4: Lateral view. 5-6. *Geranomyia circipunctata* Brunetti, genitalia showing single spine on inner rostrum of gonostyle; lateral view showing expanded ventral lobe of basal coxite and hooked apex to aedeagus. 5: Dorsal view; 6: Lateral view. 7-8. *Geranomyia cornuta* Hancock nov. spec., genitalia showing very long single spine on inner rostrum of gonostyle. 7: Dorsal view; 8: Lateral view.

Remarks: Wing length 5.6 mm. As shown in Figure 3, there are two short spines near the apex of the basal projection on the inner side of the gonostyle. Alexander (1970) seemed uncertain as to the exact nature of this character based on the material available and thought there may have been just one spine or two spines very close together. Edwards (1913) did not figure or describe the genitalia of this species. The existence of a single spine would confound using the generally available keys to genera in the Limoniini in which the supposed feature of two such spines links *Geranomyia* with *Dicranomyia* in the relevant couplet. However, a single spine is seen in the other species of *Geranomyia* known from Arabia, *circipunctata* Brunetti and *cornuta* nov. spec., as described below. *G. annandalei* has a typically long rostrum and including the mouthparts is equal in length to the combined



Plate 7. *Geranomyia circipunctata* Brunetti, whole habitus with characteristic thoracic markings. Rostrum plus mouthparts shorter than head and neck combined. Male specimen, wing length 6.0 mm.

distance from head to base of thorax. This is normally used as a key feature of the genus (Plate 8). The short rostrum of the other two known Arabian species (see below) again makes the use of the standard keys difficult.

Distribution: Described from Palestine. New to the UAE.

***Geranomyia circipunctata* Brunetti, 1912**

Plate 7, Figures 5–6

Specimens examined: Fujairah, 1♂, 5.iii–6.iv.2005; 4♂, 2.v–5.vi.2005; 3♂, 5.vi–9.vii.2005; 1♂, 3–29.xi.2005; 1♂, 1♀, 2–30.i.2006; 2♂, 3♀, 28.ii–21.iii.2006; 5♂, 2♀, 28.ii–1.iv.2006; 6♂, 15–22.iv.2006; 1♂, 20–27.v.2006; all LT. Khor al-Khwair, 1♂, 8–14.iii.2006, LT.

Remarks: In addition to the highly characteristic markings on the thoracic dorsum and the short rostrum (Plate 7), this species has only one short spine projecting from an expanded

pedicel on the inner basal projection of the gonostyle (Fig. 5). This spine is short and originates from an expanded conical base. The aedeagus is curved ventrally at the apex. Distribution: Oriental species, described from India, also occurring in the Pacific and Australia. Recorded for the first time from the Arabian Peninsula.

***Geranomyia cornuta* Hancock nov. spec.**

Plate 9, Figures 7–8

Specimens examined: Holotype: ♂, United Arab Emirates, Fujairah, 25°08'N 56°21'E, 5.iii–6.iv.2005, in light trap, leg. A. van Harten. Paratypes: 4♂, Fujairah, 2.v–5.vi.2005; 3♂, 5.vi–9.vii.2005; 1♂, 3–29.xi.2005; 4♂, 1♀, 2–30.i.2006; 2♂, 3♀, 28.ii–21.iii.2006; 5♂, 2♀, 28.ii–1.iv.2006; 6♂, 15–22.iv.2006; 1♂, 20–27.v.2006; all LT. 3♂, 1♀, Ajman, saltmarsh and mangrove, 21.ii.2007, leg. F. Menzel & A. Stark, hand-collected. 1♂, Khor al-Khwair, 8–14.iii.2006, LT.

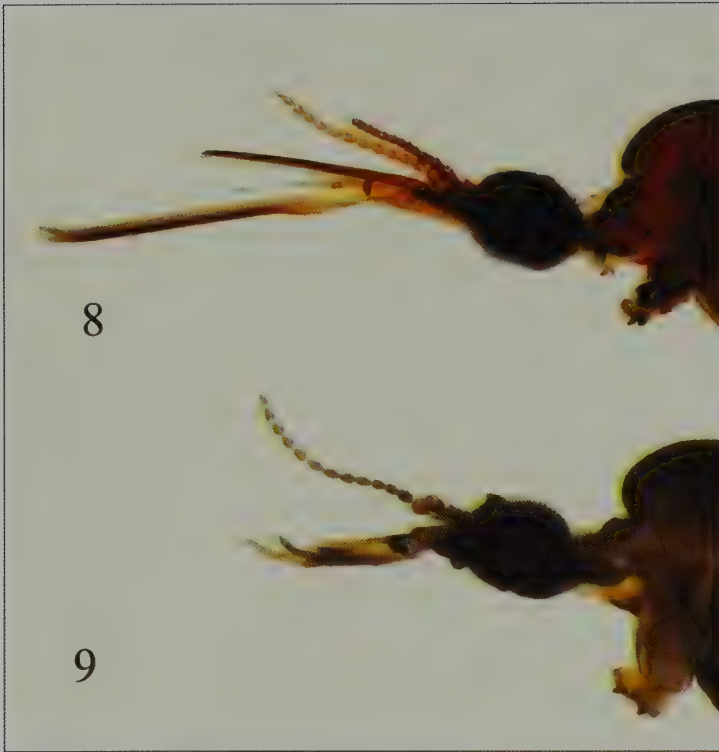
Diagnosis: Head with short rostrum, total length including mouthparts less than that of antennae; a short conical projection above antennal base (Plate 9). Head black in contrast to rostrum, neck and thorax which are medium brown; scutellum, metanotum, abdomen and legs appear slightly paler than the pleurae and dorsum. There are very small areas of darker shading in the wing membrane around the crossveins and at major forks to the radial vein but these do not constitute a discernible pattern to the naked eye. Wing length of males 5.2 mm, females 5.5 mm. Hypopygium (Fig. 7) with very long spine on inner rostrum, at least half the total length of the gonostyle. Aedeagus ventrally notched at apex (Fig. 8).

Affinities: The shortened rostrum is atypical for the genus as a whole and the only species similar in the respect is *G. circipunctata* whose rostrum is even shorter. The lack of wing spot markings means it can be distinguished immediately from that species. In addition, the dorsal projection on the head appears to be unique for the genus.

DISCUSSION

There are few species of Limoniidae known from Arabia and so all material from the area is of potential interest. Recent accounts regarding tipuloid Diptera specific to the area (Hancock, 1997, 2006 and 2010) and historical data made a total of two species of Tipulidae and 23 of Limoniidae. The UAE samples are significant in confirming eight limoniids and adding four species for the region, two of them apparently undescribed, bringing the total number to 27 species of Limoniidae. An overview that covers Saudi Arabia, Kuwait, Oman, Yemen, Socotra and the United Arab Emirates is given below.

The initial finding of a species of *Styringomyia* in Arabia (Hancock, 1997) was a considerable extension of the known geographical range of the genus. During the trapping programme in the United Arab Emirates it has proved to be common and widespread in that area. Knowledge of larval habits of *Styringomyia* is limited (Alexander, 1964) but they can develop in rotting vegetable refuse. This might explain their abundance if associated with agricultural activities. Many *Geranomyia* species are found near coastal habitats and some larvae are known to be associated with *Enteromorpha* algae growing on the shingle margins of salt water lagoons or salt marshes (Stubbs, 2008). Interestingly, in describing *G. annandalei*, Edwards (1913) recounted the finding of those specimens 'on a limestone cliff with an overhanging spring' on the Plain of Gennesaret. This area is adjacent to the Sea of Galilee where there is a high concentration of salts in the ground water. The considerable extension of range westwards of *G. circipunctata* is notable. This species is now known from Australia through Java and Malaysia to India, Sri Lanka and into Persian Gulf area.



Plates 8–9. 8: *Geranomyia annandalei* Edwards, showing elongated rostrum and mouthparts equal in length to the head and thorax. 9: *Geranomyia cornuta* Hancock nov. spec., showing small projection above antennae; rostrum and mouthparts shorter than antennae.

OVERVIEW OF THE TIPULOIDEA OF THE ARABIAN PENINSULA

The relevant regional catalogues of Diptera (Crosskey, 1980; Delfinado & Hardy, 1973; Soós et al., 1992) utilise established zoogeographical boundaries as the basis for their species lists. Arabia overlaps these to a certain extent. Egypt and countries immediately to the west of Saudi Arabia plus those North of the Persian Gulf through to Afghanistan are dealt with as part of the Palaearctic (Soós et al., 1992). Yemen is included in the Ethiopian Region as ‘Arabia Felix’ by Crosskey (1980) as is Socotra (Hancock, 2010).

Starý & Freidberg (2007) found that from Israel 84% of the species of Limoniidae had a Palaearctic distribution, with the others being Oriental, Palaeotropical, Holarctic or cosmopolitan. This figure can be compared to the 60% solely Palaearctic species from the known Arabian species, which include a greater number of Ethiopian (=Afrotropical) and Oriental species. The present list is based on records of species known from the various countries within the Arabian Peninsula as summarised in Table 1. The known distribution of the species according to the zoogeographical regions are indicated by P, H, O, E, A or N in square brackets, representing the Palaearctic, Holarctic, Oriental, Ethiopian, Australian or Neotropical respectively.

Family Tipulidae

- Tipula* (*Tipula*) *orientalis* Lackschewitz, 1930 [P, O, E]
Holorusia albovittata (Macquart, 1838) [E]

Family Limoniidae

Subfamily Hexatomini

Tribe Hexatomini

- Hexatoma* (*Eriocera*) *omanensis* Hancock, 1997 [P]

Tribe Limnophilini

- Conosia irrorata* (Wiedemann, 1828) [P, O, E, A]

Subfamily Eriopterinae

Tribe Eriopterini

- Styringomyia ebejeri* Hancock, 1997 [P]
Symplecta (*Podoneura*) *harteni* Hancock, 2006 [P]
Symplecta (*Symplecta*) *hybrida* (Meigen, 1804) [H]
Symplecta (*Trimicra*) *pilipes* (Fabricius, 1787) [P, O, E, A, N]
Erioptera spec. indet. (unpublished data)

Tribe Gonomyiini

- Gonomyia* (*Leiponeura*) *saudiarabiensis* Hancock, 1997 [P].
Gonomyia (*Leiponeura*) *yemenensis* Hancock, 2006 [P]
Idiocera (*Euptilostena*) *arabiensis* Hancock, 1997 [P]
Idiocera (*Idiocera*) *buettikeri* Hancock, 1997 [P]
Idiocera (*Idiocera*) *hofufensis* Hancock, 1997 [P]
Idiocera (*Idiocera*) *omanensis* Hancock, 1997 [P]
Idiocera (*Idiocera*) *lanciformis* Hancock, 1997 [P]
Idiocera (*Idiocera*) *lobatostylatus* Hancock, 1997 [P]
Idiocera (*Idiocera*) *socotranensis* Hancock, 2010 [E]
Idiocera (*Idiocera*) *sziladyi* (Lackschewitz, 1940) [P]
Trentepohlia (*Trentepohlia*) spec. indet. (vide Hancock, 1997) [P, O, E]

Subfamily Limoniinae

Tribe Antochini

- Antocha* spec. indet. (vide Hancock, 1997) [P, O, E]
Orimarga arabica Hancock nov. spec. [P]
Thaumastoptera calceata Mik, 1866 [P]

Tribe Limoniini

- Libnotes* (*Afrolimonia*) *sokotrana* (Alexander, 1920) [E]
Dicranomyia (*Dicranomyia*) *convoluta* Hancock, 2006 [P]
Dicranomyia spec. indet. (vide Hancock, 1997)
Geranomyia annandalei Edwards, 1913 [P]
Geranomyia circipunctata Brunetti, 1913 [O, A]
Geranomyia cornuta Hancock nov. spec. [P]

Table 1. Numbers of species and records of craneflies known from the Arabian Peninsula. Figures derived from this paper and data from the Cranefly Catalogue of the World website.

	KSA	Kuwait	UAE	Oman	Yemen	Socotra	total species	total records
Tipulidae	1	0	0	0	1	1	2	3
Limoniidae	8	2	12	9	6	3	27	40
Total	9	2	12	9	7	4	29	43

KSA = Kingdom of Saudi Arabia

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Author's address:

Mr E. G. Hancock, Hunterian Museum (Zoology), Graham Kerr Building, University of Glasgow, Glasgow, G12 8QQ, Scotland; e-mail: ghancock@museum.gla.ac.uk

Order Diptera, family Asilidae

Jaroslav Bosák & Milan Hradský

INTRODUCTION

Worldwide more than 7000 species of robber flies are known. However, only three species had formerly been recorded from the UAE – *Apoclea femoralis* (Wiedemann, 1828), *Lamyra vorax* Loew, 1858, and *Stichopogon* spec. (van Harten, 2005; Howarth, 2006). The most important contributions to the knowledge of the robber flies of the Arabian Peninsula were published by van der Wulp (1899), Becker (1910), Engel (1930) and Efflatoun (1934, 1937). The only more recent work describing robber flies of this area is that of Theodor (1980). For a complete information it is necessary to mention works on the asilids of Sokotra (Becker, 1910; Geller-Grimm, 2002; Ricardo, 1903), and of northeastern Africa (Bezzi, 1906).

Robber flies occur in various habitats, from forests and meadows to desert areas, but they may be found in any sunny sites, where they bask on bare ground and flowers, stems and branches of trees, or rocks. All known species are predators, hunting for other insects. Their prey is attacked either from raised places which can be called ‘observation posts’, or they search for prey during low level flight among vegetation. The prey is often as big as the hunter, sometimes even bigger. Robber flies prey on any flying insects of suitable size, including Coleoptera, Odonata, Hymenoptera or other predators. Even cannibalistic behaviour is no exception. Females lay eggs on grass, leaves of shrubs, or in the soil. The females of some genera lay eggs into the wood of deciduous and coniferous trees. The larvae of Asilidae are probably exclusively carnivorous. For more details concerning the morphology of preimaginal stages and their biology see Majer (1997).

The fauna of the family Asilidae of UAE is a mixture of Palaearctic and Afrotropical faunal elements (for more see the Discussion below). For this reason we refer to fundamental, especially taxonomical, works covering both biogeographical regions.

MATERIALS AND METHODS

The specimens listed in the following survey have partly been collected by A. van Harten and K. Mahmoud, partly by the authors during their entomological expeditions to the UAE in 2008 and 2009. A large number of specimens collected by A. van Harten was mounted and labelled by Dr. John Deeming at Cardiff, UK, and subsequently sent to the authors. The specimens dealt with are deposited in the collections of authors, in the United Arab Emirates Invertebrate Collection and in the collection of the National Museum of Wales, Cardiff, UK. Some paratypes of new species are also deposited in the entomological collections of the Silesian Museum, Opava, Czech Republic and the Zoological Museum, Copenhagen, Denmark.

Morphological terminology generally follows that of Geller-Grimm (2003). The generic nomenclature used here is adopted from the World catalogue of the genera of the family Asilidae (Geller-Grimm, 2004).

Remarks on the distribution of individual species were taken from reviews published by Geller-Grimm (2008), Lehr (1988) and Londt (2005).

Abbreviations used in text: AvH = leg. A. van Harten; HC = hand collected; LT = light trap; MT = Malaise trap; PT = pitfall trap; WT = water trap; JBC = Jaroslav Bosák Collection, Olomouc, Czech Republic; MHC = Milan Hradský Collection, Zámucky, Czech Republic.

SYSTEMATIC ACCOUNT

Subfamily **Apocleinae** Papavero, 1973Genus **Apoclea** Macquart, 1838

The genus *Apoclea* includes 20 rather uniform species distributed in the Palaearctic (16 species) and Oriental (4 species) regions. Three species extend through the Arabian Peninsula and North Africa to the Afrotropical region (Londt, 2005). The identification of particular species is thus rather difficult without comparative material. The genus was elaborated upon by Becker (1908). No recent revision has been published.

Key to the species of *Apoclea* Macquart, 1838, occurring in the UAE

- 1 Legs yellow, without dark margin, abdomen with striking triangular ornamentation (Plate 4) ***A. helvipes*** Loew
- Legs, especially femora with dark ornamentation or entirely black (except females of *A. beckeri* nov. spec.), abdomen with grey tomentum, without triangular ornamentation **2**
- 2 5th radial cell closed with a long connecting vein (Fig. 8), mesonotum with just white hairs, the 3rd antennal segment short, lanceolate, yellow, femora of hind legs with dark stripe, red-yellow base (male, female), male hypopygium large, rounded and densely white haired, female terminalia with light (glassy) acanthophorite spurs ***A. inarticulata*** Theodor
- 5th radial cell open or closed in wing margin **3**
- 3 5th radial cell widely open (Fig. 7), mesonotum mainly with black hairs, 3rd antennal segment long, yellow, lanceolate, male femora III with very wide dark stripe, female femora 3 red, with a negligible spot, hypopygium long, oval, with fine black hairs, female terminalia with black acanthophorite spurs, 8th sternite terminated with a 'hook' ***A. heteroclita*** van der Wulp
- 5th radial cell tightly open or closed in wing margin (Fig. 6) **4**
- 4 In male femora of hind legs dark, black, slightly red at base, in female femora of hind legs red with dark stripe from a half to apex (Plate 8). Mesonotum with light-yellow hairs, 3rd antennal segment short, yellow, droplet-shaped. Hypopygium oval with delicate white hairs, female terminalia with black acanthophorite spurs, 8th sternite terminally pointed ***A. femoralis*** (Wiedemann)
- In male femora of hind legs yellow, with a dark spot on apex, in female femora of hind legs yellow, without spot (Plates 1, 2). Mesonotum lightly haired with delicate, short yellow hairs, 3rd antennal segment short, pear-shaped, yellow. Hypopygium sub oval with delicate white hairs, female terminalia with black acanthophorite spurs, 8th sternite terminally round, semicircular. ***A. beckeri*** nov. spec.

***Apoclea beckeri* Bosák & Hradský nov. spec.**

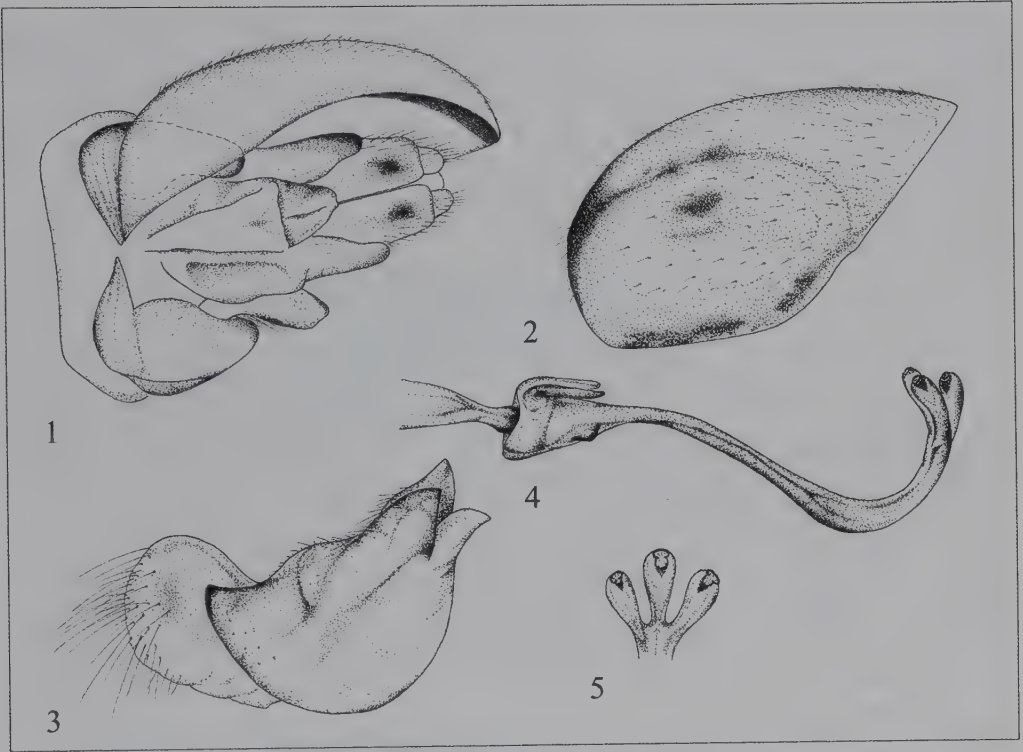
Plates 1–2, Figures 1–5

Specimens examined: Holotype: ♂, al-Ajban [24°36'N 55°01'E], 9.iv–2.v.2006, in Malaise trap, leg. A. van Harten (MHC). Paratypes: 1♂, 1♀, same locality but 12–19.vi.2005, MT; 1♀, 17–24.iv.2006, MT; 1♂, 1♀, 1.iv–2.v.2006, MT; 4♂, 17♀, 9.iv–2.v.2006, MT; 2♂, 3♀, 22–29.v.2006, MT; 1♂, 2♀, 26.vi–25.vii.2007, MT; 1♀, 22.x–9.xi.2006, MT; all AvH.

Description: Male. Head. Mystax white, palpi with white hairs. Antennae red-yellow. Postpedicel as long as wide. Stylus black, 3× longer than postpedicel. Thorax with silver tomentum and with very short, white bristles. Scutellar setae 2, yellow. Wings clear, veins



Plates 1–2. *Apoclea beckeri* Bosák & Hradský nov. spec. 1: Male; 2: Female.



Figures 1–5. *Apoclea beckeri* Bosák & Hradský nov. spec., male terminalia. 1: Male terminalia ventral (without left epandrium); 2: Epandrium lateral; 3: Dististylus; 4: Aedeagus; 5: Aedeagus, apical part.

yellow, darker on tip. Vein R_4 with rudimentary vein, veins R_5 and M_1 connected in wing margin. Legs yellow, femora of front and middle legs with a short dark spot in the middle of the interior side. Femora of hindlegs with a dark stripe on outer side. Tibiae of front and middle legs and tarsi yellow. Hairs light, whitish, only tarsi with black setae on ventral side. Abdomen yellowish with fine white hairs, laterally with yellowish hairs. Hypopygium axe-shaped with white hairs.

Female as male, legs without marking, female terminalia yellow with black acanthophorite spurs. Eighth sternite rounded.

Size: 10–12 mm.

Remarks: The new species is similar to *A. helvipes* Loew, 1873, and *A. aparta* Becker, 1908. From *A. helvipes* it varies by the absence of the very expressive ‘changing’ triangular pattern on the abdomen of both males and females (Plate 4) and by a regular arrangement of abdominal hairs. *A. aparta*, in contrast to *A. beckeri*, has the cell r_5 widely open.

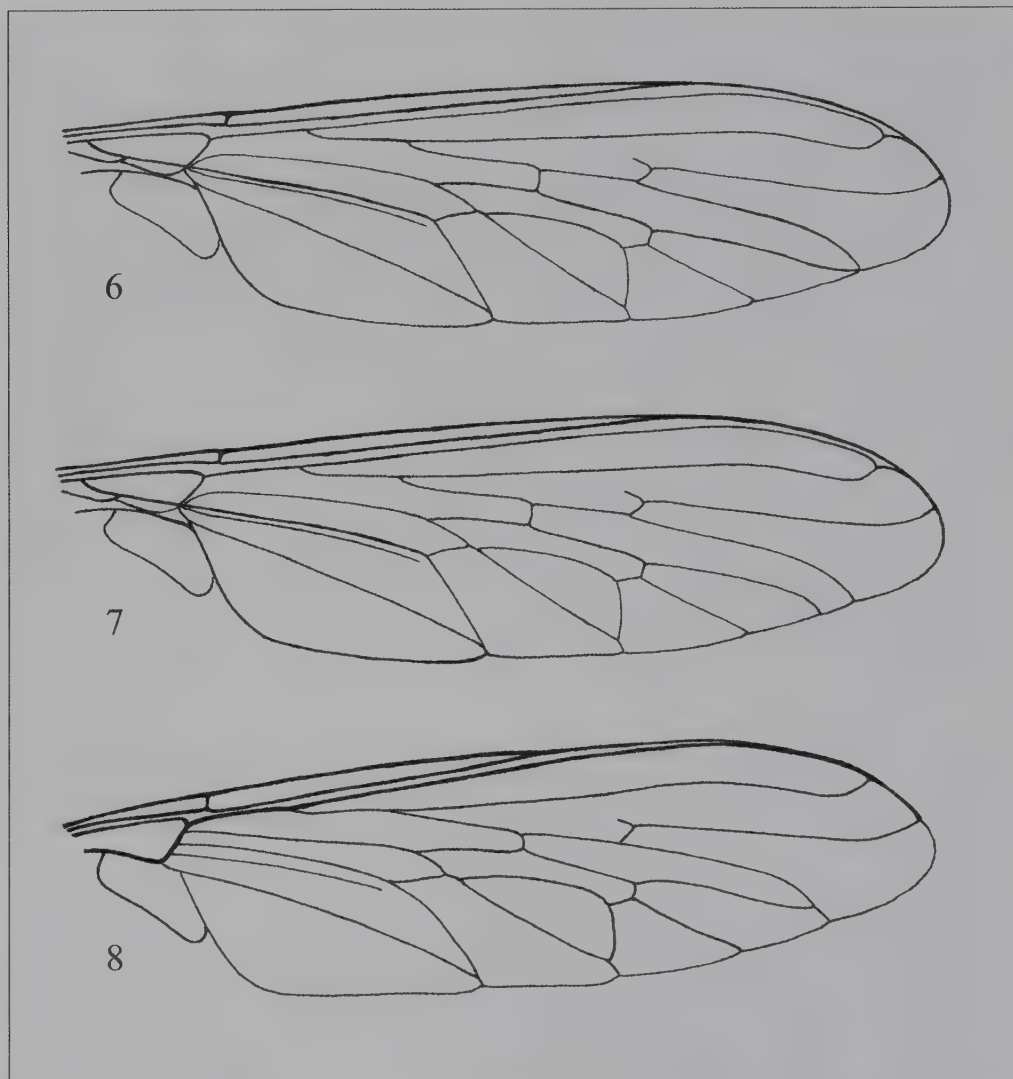
Distribution: Palearctic: UAE.

Etymology: This species is named in honour of Theodor Becker, who was the first to publish a comprehensive taxonomical study on the genus *Apoclea*.

Apoclea femoralis (Wiedemann, 1828)

Specimens examined: Ar-Rafah, 8♂, 10♀, 2–7.iv.2009, HC, leg. J. Bosák.

Plate 3, Figure 6



Figures 6–8. Wings. 6: *Apoclea femoralis* (Wiedemann); 7: *Apoclea heteroclita* van der Wulp; 8: *Apoclea inarticulata* Theodor.

Remarks: A record of this species from the UAE was published by Walker & Pittaway (1987). Consequently, it was included in both currently available checklists – van Harten (2005) and Howarth (2006).

Distribution: Afrotropical: Nigeria, Sudan. Palaearctic: Egypt, Israel, Iran, UAE, Yemen.

***Apoclea helvipes* Loew, 1873**

Plates 4–6

Specimens examined: N of Ajman, 1♂, 1♀, 18–22.v.2008, WT; 1♀, 25.v–12.vi.2008, WT, all AvH. Near Hamraniyah, 4♂, 5♀, 2–7.iv.2009, HC, leg. J. Bosák. Ar-Rafah, 1♀, 18–22.v.2008, WT, AvH.



3



4

Plates 3–4. 3: *Apoclea femoralis* (Wiedemann), male; 4: *Apoclea helvipes* Loew, abdomen.



Plates 5–6. *Apoclea helvipes* Loew. 5: Male; 6: Female.

Remarks: The species was described by Loew on the basis of Asian material without specified locality. Widely distributed. Thorax with white hairs, scutellum with white discal scutellar setae. Veins yellow, cell r5 widely open. Femora and tibiae yellow, tarsi black at apex. Male terminalia black, similarly shaped as in *A. inarticulata*. Female as male, 7th–8th abdominal segments black, anal lamellae with white acanthophorite spurs and white hairs.

Distribution: Palaearctic: Algeria, Central Asian part of the former USSR, Kazakhstan, Iran, Turkey. New to the UAE.

***Apoclea heteroclitia* van der Wulp, 1899**

Figure 7

Specimens examined: Al-Ajban, 1♂, 2♀, 10–17.x.2005; 3♀, 22.x–9.xi.2005, MT; 8♂, 19♀, 5–12.vi.2006, MT; 4♀, 12–19.vi.2006, MT; 4♂, 19–26.vi.2006, MT; 6♂, 9♀, 26.vi–25.vii.2006, MT; 3♀, 5.vii–21.viii.2006, MT; 13♂, 8♀, 21.viii–19.ix.2006, MT; 2♀, 22.x–9.xi.2006, MT. SSW of ad-Dhaid, 3♂, 5♀, 7–14.ix.2006, LT. Fujairah, 2♂, 20–27.v.2006, LT. Hatta, 2♂, 17–24.viii.2006, LT. Sharjah, 1♂, 12–28.vi.2005, LT. Sharjah Desert Park, 4♂, 1♀, 31.v–30.vi.2005, LT; 6♂, 6♀, 30.vi–21.vii.2005, LT; 6♂, 21.vii–5.viii.2005, LT; 4♂, 25.v–16.vi.2008, WT; 5♂, 2♀, 16.vi–17.vii.2008, LT; 1♂, 17–24.vii.2008, LT; 3♀, 24.vii–14.viii.2008, LT. Sharjah-Khor Kalba, near tunnel, 2♂, 31.v–7.vi.2006, LT. Wadi Bih dam, 2♀, 30.v–5.vi.2007, LT; 1♂, 4♀, 30.iv–4.vi.2008, LT; 1♀, 29.vi–08.vii.2008, LT. Wadi Shawkah, 1♀, 31.x–27.xi.2006; 4♀, 9–24.vi.2007, WT; 1♂, 3♀, 25.x–15.xi.2007, WT; 1♂, 15.v–12.vi.2008, WT; 1♂, 17.viii–11.ix.2008, WT. All AvH.

Distribution: Species so far only recorded from Yemen. Its distribution in arid areas of North Africa and the Middle East is probably much wider. New to the UAE.

***Apoclea inarticulata* Theodor, 1980**

Plates 7–9, Figure 8

Specimens examined: N of Ajman, 20♂, 13♀, 25.iii.2008, HC, leg. J. Bosák; 3♂, 22.ix–17.x.2008, WT, AvH; 1♂, 1♀, 1–14.ii.2009, WT, AvH; 1♀, 17.ii.2009, HC, leg. M. Jaschhof; 2♂, 3♀, 15–16.iii.2009, WT, AvH; 5♂, 6♀, 2–7.iv.2009, HC, leg. J. Bosák. Nazva [25°04'N 55°43'E], 1♀, 30.ix.2007, HC, leg. J. Batelka & H. Pinda. Ar-Rafah, 1♀, 27–30.iv.2008, WT, AvH; 5♂, 3♀, 2–7.iv.2009, HC, leg. J. Bosák. S of Ra's al-Khaimah, 7♂, 12♀, 5–6.iv.2008, HC, leg. J. Bosák. Um al-Quwain, 1♀, 1–30.xi.2008, WT, AvH; 2♂, 2♀, 11–13.iii.2009, leg. C. Schmid-Egger; 1♂, 1♀, 25.iii.2008, HC; 13♂, 6♀, 26.iii.2008, HC; 1♂, 5–6.iv.2008, HC; 7♂, 14♀, 2–7.iv.2009, HC, all leg. J. Bosák. Wadi Bih dam, 16♂, 3♀, 22–29.iii.2007, LT, AvH.

Remarks: The species differs from other relatives mainly in the structure of the male and female genitalia (see Theodor, 1980) and by numerous setae on the abdomen.

Distribution: Palaearctic: Israel, Jordan. New to the UAE.

Genus *Neolophonotus* Engel, 1925

Neolophonotus is distributed within three zoogeographical regions. The Oriental region is the poorest in species diversity – there is only one species occurring in this region: *N. indicus* Bromley, 1935. In the Palaearctic region, there are a fossil species *N. klebsi* (Meunier, 1908) and recent species *N. efflatouni* Londt, 1987 (Egypt), *N. macropterus* (Loew, 1854) (Sudan, Egypt), and doubtfully recorded *N. leucotaenia* (Bezzi, 1906) (Ethiopia, Egypt?). However, the evolutionary centre of the genus is in the Afrotropical region. Here the genus reaches the greatest specific diversity and with more than 250 species it belongs to the largest genera within the family Asilidae (Londt, 2005). Londt (1985, 1986, 1987, 1988, 1990) revised the genus, and solved also some nomenclatural questions (Londt, 2004). The biology of the below described species is largely unknown. The specimens examined originate from sites with vegetation. Most probably their habitat requirements resemble those of *Neolophonotus dichaeus* Hull, 1967, as described by Londt & Harris (1987). In the Arabian Peninsula the findings of other, even unnamed species of the genus can be expected.



Plate 7. *Apoclea inarticulata* Theodor, male.

***Neolophonotus londti* Bosák & Hradský nov. spec.**

Plates 10–11, Figure 9

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Bih dam [25°48'N 56°04'E], 24.iv–1.v.2007, in light trap, leg. A. van Harten (JBC). Paratypes: 1♀, same data as holotype; 1♀, same locality but 29.iii.2008, HC, leg. J. Bosák; 1♀, 24.iv–1.v.2007, LT; 1♂, 19.ii–1.iii.2008, LT; 2♀, 21–30.iv.2008, LT; 1♂, 13–21.iv.2009, LT; all AvH; 17♂, 23♀, 2–7.iv.2009, HC, leg. J. Bosák. N of Ajman, 1♂, 3♀, 18–22.v.2008, WT, AvH. Khor Fakkan, 1♀, 31.iii–3.iv.2008, HC, leg. J. Bosák. Sharjah Desert Park, 1♂, 16.vi–15.vii.2008, LT, AvH. Wadi Shawkah, 1♀, 25.x–15.xi.2007, WT, AvH. Description: Male. Head. Ocellar tubercle with black setae. Antennae black, basal segments with black setae and hairs. Face silver dusted. Mystax yellow-white, under antennae overlapping lines of black hairs. Postocular bristles white, bent forward. Occipital bristles yellow-white. Palpus black with yellow-white bristles. Mesonotum very rounded, dark, grey dusted with fine, white hairs. Paramedian stripe of scutum with black, long, dense and stiff bristles forming 'mane'. Discal scutellar setae white. Three notopleural, 2 supraalar and 2 postalar bristles. Scutellum with dense, long, yellow-white hairs and with tuft of black bristles at the end of 'mane'. Margin of scutellum with yellow setae. Thorax laterally silver dusted. Katatergal bristles yellow-white. Coxal setae white. Legs. Femora black with short, white hairs and yellow-white bristles, tibiae red-black, with black setae on apex. Tarsi black with black bristles. Wings. Hyaline, veins brown. Costa with white-yellow hairs, halteres yellow. Abdomen. Grey dusted, tergites with white hairs and bristles. Dark spots on tergites with dark hairs. Sternites grey dusted, with very short white hairs. Male terminalia with thin, short, white hairs. Hypandrium brown, long, narrow. Epandrium with dense, long, white hairs on apex.



Plates 8–9. *Apoclea inarticulata* Theodor. 8: Female; 9: Male and female in copula.



10



11

Plates 10–11. *Neolophonotus londti* Bosák & Hradský nov. spec. 10: Male; 11: Female.

Female similar to male.

Size: 10–12 mm.

Remarks: This species is distinctive on account of its dense, evenly high mane on thorax. It varies from known species by the anatomy of the male terminalia.

Distribution: Palaearctic: UAE. Both *Neolophonotus* species described here occurred together at the same sites.

Etymology: The species is named after J.G.H. Londt, who published an extensive, four-part monography about this mainly African genus, several species of which also reach the Palaearctic region.

***Neolophonotus papei* Bosák & Hradský nov. spec.**

Plates 12–13, Figure 10

Specimens examined: Holotype: ♂, Wadi Wurayah [25°24'N 56°17'E], 12–14.iv.2005, in Malaise trap, leg. T. Pape (MHC). Paratypes: 1♂, same data as holotype; 1♂, same locality but 11–18.v.2007, MT, AvH. 1♀, Khor Fakkan, 31.iii–3.iv.2008, HC, leg. J. Bosák. 2♂, Wadi Bih dam, 19.ii–1.iii.2008, LT, AvH. 2♀, Wadi Madaq, 29.iii–10.iv.2006, WT, AvH.

Description: Male. Head. Ocellar tubercle small, with black setae. Antennae black, basal segments with black setae and hairs. Face with silver tomentum. Mystax yellow-white, short, contiguous. Yellow hairs under antennae overlap series of black hairs. Postocular bristles black, bent forward. Occipital bristles yellow-white. Palpus black with yellow-white bristles. Mesonotum dark, with grey tomentum and short, minute, black bristles. Paramedian stripe of scutum with black, short, dense and contiguous bristles forming a 'mane'. Dorsocentral bristles black, in 6 pairs of strong and 3 pairs of short bristles in front of transverse suture. Three notopleural, 2 supralar and 1 postalar bristles. Scutellum with dense, long, yellow-white hairs. Eight white discal scutellar setae. Thorax laterally silver dusted. Katatergal bristles yellow-white, coxal setae white. Legs. Femora black with short white hairs and yellow-white setae. Tibiae black, with red apices and similar bristles as in femora. Tarsi black with black bristles. Basitarsus of third leg with red apex. Wings. Clear, veins brown, costa with black setae. Halteres yellow. Abdomen with grey tomentum. Tergites with narrow silver stripe on apices. First tergite with dense white hairs. Second and 3rd tergites with dark spots, black hairs, white hairs only laterally. Sternites with silver-grey tomentum and white hairs. Hypandrium dark, red-brown with white hairs, epandrium with dense, white hairs on apex. Female as male. Tergites darker with triangular spots. Female terminalia laterally compressed, black.

Size: 10–12 mm.

Remarks: This species has a characteristic unevenly high mane reaching from anterior to posterior part of the thorax to the scutellum. It varies from known species by the anatomy of male terminalia.

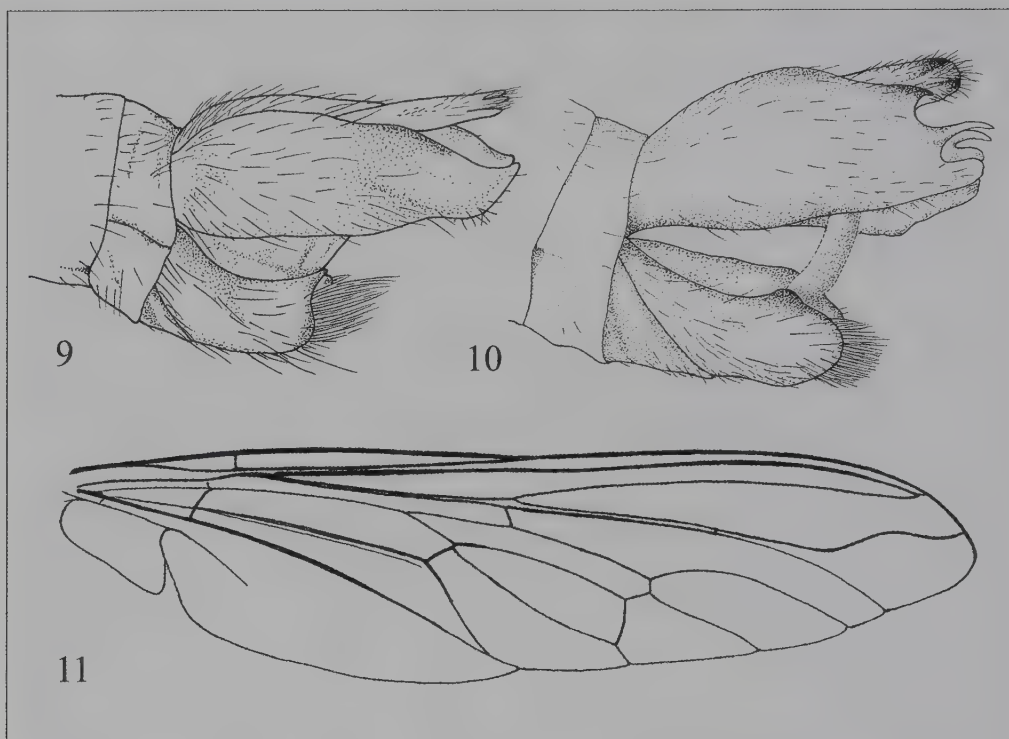
Distribution: Palaearctic: UAE. Both *Neolophonotus* species described here occurred together at the same sites.

Etymology: Named after the collector T. Pape, whose material was used to first recognize the new species.

Genus ***Promachus*** Loew, 1848

Figure 11

Promachus belongs with its more than 220 species to the richest genera of the family Asilidae. Representatives of the genus are distributed within all zoogeographical regions, except the subpolar areas. In the Palaearctic region there are approx. 30 species, in the Afrotropical region more than 90 species. However, modern revisionary works of the genus are lacking, except for the Afrotropical *P. fasciata* group (Hobby, 1936). The species listed below may be close to the representatives of the Ethiopian fauna of the genus.



Figures 9–11. 9–10. Male terminalia. 9: *Neolophonotus londti* Bosák & Hradský nov. spec. 10: *Neolophonotus papei* Bosák & Hradský nov. spec.; 11. Wing of *Promachus* spec.

Only three females belonging to two species were found in the material examined. Thus, their precise identification has not been possible. Both these species are characterised by the presence of short black bristles on the entire surface of thorax. They mutually differ mainly by the colour of their legs. *Promachus* spec. 1 has femora and tibiae entirely yellow without dark spots. *Promachus* spec. 2 has all three femora light brown but with striking dark ornament extended along the whole length of their outer side.

***Promachus* spec. 1**

Plate 14

Specimens examined: Sharjah Desert Park, 1♀, 24.vii–14.viii.2008, LT, AvH. Wadi Bih dam, 1♀, 30.iv–4.vi.2008, LT, AvH.

***Promachus* spec. 2**

Specimens examined: Wadi Bih dam, 1♀, 6–13.v.2007, LT, AvH.

Subfamily **Asilinae** Latreille, 1802

Genus ***Eremisca*** Hull, 1962

The genus *Eremisca* was described by Zinovjeva (1956) on the basis of two species from arid areas of Kazakhstan and Central Asia. However, the type species of the genus – *Eremisca vernalis* Zinovjeva, 1956 – was not designated before Hull (1962). All known 17 species are

12



13



Plate 12–13. *Neolophonotus papei* Bosák & Hradský nov. spec., 12: Male; 13: Female;

distributed in arid areas of the Palaearctic region. A revision of the genus, including key and illustrations of the male and female terminalia, was published by Lehr (1964, 1987).

Eremisca heleni (Eflatoun, 1934)

Plate 15

Specimens examined: Al-Ajban, 3♀, 28.xii.2005–29.i.2006, LT & MT, AvH. 7 km S of al-Jazirat al-Hamra, 1♂, 1♀, 1.xii.2004, WT, AvH.

Remarks: The species was described by Eflatoun (1934) in the genus *Cerdistus* Loew, 1849. It was transferred to the genus *Eremisca* by Lehr (1987). The illustration of the male terminalia was published by Theodor (1980).

Distribution: Palaearctic: Morocco (?), Egypt, Israel, Oman, Iran. New to the UAE.

Subfamily **Dasygoninae** Macquart, 1838

Genus ***Saropogon*** Loew, 1847

The genus, containing a large number of species, is distributed all over the world. The largest species diversity, more than 60 species, can be found in the Palaearctic region. On the other hand, it is rather poorly represented in the Afrotropical fauna – with only 8 described species. The genus is characterised by its sexual dimorphism manifested by different colour of males and females. There is no comprehensive work covering the Palaearctic fauna. For the identification of the material from the Arabian Peninsula the studies of Eflatoun (1937), Theodor (1980) and Engel (1930) were used. Species of the Afrotropical region were dealt with by Londt (1997).

Saropogon pseudojugulum Theodor, 1980

Plates 16–18

Specimens examined: Sharjah Desert Park, 1♀, 26.iii.2008, HC, leg. J. Bosák & M. Hradský. Um al-Quwain, 23♂, 17♀, 25.iii.2008, HC; 2♂, 3♀, 26.iii.2008, HC; all leg. J. Bosák & M. Hradský; 3♂, 4♀, 26.iii.2008, HC, leg. K. Mahmood; 1♂, 1♀, 2–7.iv.2009, leg. J. Bosák. Ar-Rafah, 1♂, 29.iii.2008, HC; 1♀, 6.iv.2008, HC, leg. J. Bosák. Wadi Bih dam, 2♀, 19.ii–1.iii.2008, LT, AvH. S of Ra's al-Khaimah, 1♂, 5–6.iv.2008, HC; leg. J. Bosák.

Remarks: So far the species was only known from Egypt and Israel. Most probably it occurs within the entire Arabian Peninsula. It is distinguished by striking sexual dimorphism: males are black except for the legs, where, particularly in the front and middle pair, brown-yellow colour prevails. On the other hand, females have striking red spots on tergites 5–8 and legs red-yellow.

Distribution: Palaearctic: Egypt, Israel. New to the UAE.

Saropogon alternatus Loew, 1873

Plate 19

Specimens examined: Sharjah Desert Park, 1♀, 22.v–4.vi.2007, LT, AvH.

Remarks: The species has been so far only known from Iran. The record from the UAE is based on a single female. The very long red-brown antennae is a striking feature of this species. The 3rd antennal segment is dark in distal half. Tergites of the female abdomen are all brown-red. The male remains unknown.

Distribution: Palaearctic: Iran. New to the UAE.

Subfamily **Laphriinae** Macquart, 1838

Genus ***Ctenota*** Loew, 1873

A small genus represented by 7 species in the Palaearctic region, two species of which extend into the Afrotropical region. *Ctenota* includes small to medium-sized species inhabiting arid



Plates 14–15. 14: *Promachus* spec. 1, female; 15: *Eremisca heleni* (Eflatoun), female, dorsally.



Plates 16–17. *Saropogon pseudojugulum* Theodor. 16: Male, dorsally; 17: Female, laterally.



Plate 18. *Saropogon pseudojugulum* Theodor, female.

barren areas. The genus has been repeatedly treated by Lehr (1960, 1964). An additional species was subsequently described by Theodor (1980).

***Ctenota ruficornis* van der Wulp, 1899**

Plates 20–21, Figure 12

Specimens examined: Wadi Bih dam, 1♂, 19.ii–1.iii.2008, LT, AvH.

Remarks: The species was described on the basis of material originating from contemporary Yemen. It differs from other relatives especially by different colour of wing membrane.

Distribution: Palaearctic: North Africa, Yemen, Turkmenistan, Uzbekistan, Tadzhikistan, Kazakhstan. New to the UAE.

***Ctenota* spec.**

Plates 22–23

Specimens examined: N of Ajman, 1♀, 22.ix–17.x.2008, WT, AvH.

Remarks: A large species (female = 20 mm). It differs from the above species by the striking white pubescence of the entire body, which is otherwise black. Antennae red. Vein M2 reaches the wing margin.

Genus *Lamyra* Loew, 1851

The genus *Lamyra* comprises 4 species of very large robber flies. The distribution centre of the genus is located in the Afrotropical region. The range of *L. vorax* is extended from Africa over the Arabian Peninsula into the Palaearctic region. A key to *Lamyra* species was published by Dikow & Londt (2000).



Plate 19. *Saropogon alternatus* Loew, female.

***Lamyra vorax* Loew, 1858**

Plates 24–26

Specimens examined: Near Khor Fakkan, 14♂, 3♀, 31.iii–3.iv.2008, HC, leg. J. Bosák, Wadi Bih dam, 1♂, 24.iv–1.v.2007, LT, AvH; 1♂, 5.iv.2008, HC, leg. J. Bosák.

Remarks: This species was recorded from the UAE (Sharjah) by Dikow & Londt (2000). This record was subsequently included in the 'Catalogue of the Afrotropical Asilidae' (Londt, 2005) and the 'Checklist of true flies of the UAE' (Howarth, 2006). Nothing is so far known about the biology of this species. In 2008, the species was very abundant in Khor Fakkan. Together with this species a large metallic woodborer (Buprestidae), *Julodis euphratica euphratica* Laporte & Gory, 1835, was found. Species of *Julodis* develop underground, the larvae moving freely and feeding on roots of trees, bushes and probably also herbs. It creates a big hard cocoon made of soil. In 2008, one of the authors observed a female of this robber fly moving on the ground and creeping into holes under stones. It was probably looking for a place to lay eggs. Taking into consideration the large size of the adult flies, their larval development could be associated with *Julodis*; possibly the fly larvae prey on the larvae of the beetle.

Distribution: Afrotropical: Burkina-Faso, Djibouti, Ethiopia, Gambia, Ghana, Mauritania, Sudan. Palaearctic: Egypt (?), Israel, Oman, Saudi Arabia, UAE, Yemen.

Genus *Stiphrolamyra* Engel, 1928

The genus *Stiphrolamyra* currently comprises 14 species. The majority of species (9) occurs in the Afrotropical region, 5 species extend into the Palaearctic region, 4 of which occur outside the African continent. These species are *L. rubicunda* Oldroyd, 1947, mentioned from



Plates 20–21. *Ctenota ruficornis* van der Wulp, male. 20: Dorsal view; 21: Lateral view.



Plates 22–23. *Ctenota* spec. 1, female. 22: Dorsal view; 23: Lateral view.

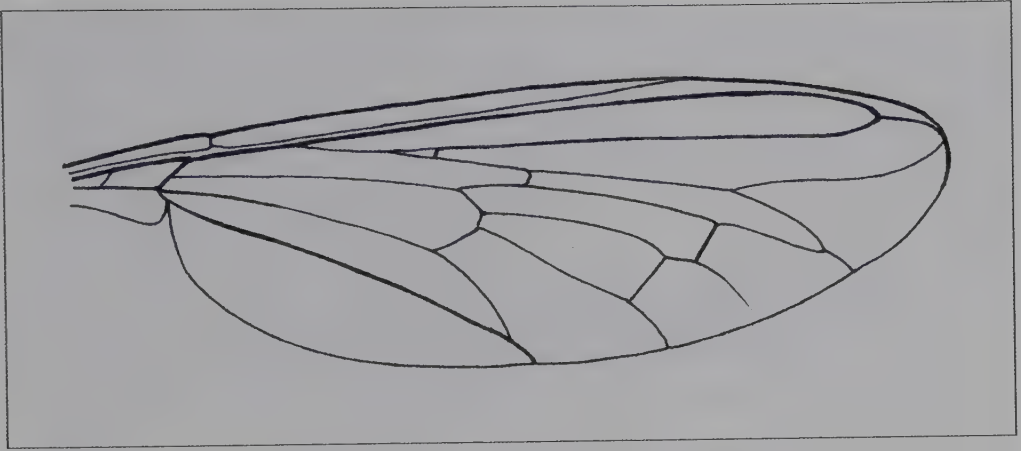


Figure 12. Wing of *Ctenota ruficornis* van der Wulp.

northern Africa (Morocco, Libya, Egypt, Israel), *L. pleskei* (Becker, 1913) from Iran and Turkey, *L. sinaitica* Theodor, 1980, from Jordan and Egypt, and *L. albibarbis* Engel, 1928, known from the Arabian Peninsula. A key to the Palaearctic species, including remarks concerning their distribution, was published by Hradský & Geller-Grimm (1997); the sub-Saharan species were revised by Londt (1983).

***Stiphrolamyra albibarbis* Engel, 1928**

Plates 27–28

Specimens examined: Wadi Bih dam, 7♂, 19.ii–1.iii.2008, LT, AvH. Wadi Wurayah, 1♂, 12–14.iv.2005, MT, leg. T. Pape.

Remarks: Hereto this species was only known from Yemen. It was not included in the paper by Hradský & Geller-Grimm (1997) because of the lack of material in the authors' collections. It differs from other Palaearctic species of the genus by its size (approx. 10 mm) and red abdomen.

Distribution: Afrotropical: Yemen. New to the UAE.

Subfamily **Laphystiinae** Hendel, 1936

Genus ***Trichardis*** Hermann, 1906

An attractive genus comprising 29 species distributed in the Palaearctic (4 species), the Afrotropical (25 species) and the Oriental (1 species) regions. *T. leucocoma* occurs in both the Palaearctic and the Afrotropical regions. A revision of the Afrotropical species was published by Londt (2008). No such work exists for the Palaearctic species. In 2002, a new species was described from the Island of Socotra (Geller-Grimm, 2002).

***Trichardis leucocoma* (van der Wulp, 1899)**

Plates 29–30

Specimens examined: Near Hamraniyah, 2♂, 2–7.iv.2009, HC, leg. J. Bosák.

Remarks: Due to its light pubescence of the entire body it is a striking and attractive species. Both specimens were collected sitting on the ground in sand dunes with sparse herbal vegetation and low bushes.



Plates 24–25. *Lamyra vorax* Loew, male. 24: Dorsal view; 25: Lateral view.



Plate 26. *Lamyra vorax* Loew.

Distribution: Afrotropical: Yemen. Palaearctic: Morocco (?), Algeria, Arabian Peninsula, Egypt, Israel, Iran, the Central Asian part of the former USSR, Kazakhstan, Mongolia. New to the UAE.

Subfamily **Leptogastrinae** Schiner, 1862

Genus *Leptogaster* Meigen, 1803

A species-rich genus with world-wide distribution. Over 60 species are known from the Palaearctic region and more than 70 from the Afrotropical region. Records of 6 species were published from arid areas of the Arabian Peninsula (Theodor, 1980). Thus, the species described below are only the 7th and 8th species distributed within this area.

Leptogaster arabica Bosák & Hradský **nov. spec.**

Plate 31. Figures 13-14

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Wurayah [25°24'N 56°17'E], 12–14.iv.2005, in Malaise trap, leg. T. Pape (MHC). Paratypes: 2♂, same data as holotype; 2♂, 1♀, same locality but 14.xi–4.xii.2007, MT, AvH. 1♂, N of Ajman, 29.iii.2007, HC, AvH. 1♂, Wadi Madaq, 29.iii–10.iv.2006, WT, AvH; 1♂, 18.xi–15.xii.2007, PT, AvH.

Description: Male. Head. Ocellar tubercle in the level of eyes, frons and face silvery dusted. Antennal segments yellow, scape bowl-like, pedicel round, postpedicel skittle-shaped and 1.5 times as long as first two segments together. Arista as long as postpedicel. Palpus yellow, proboscis black. Mystax formed by 10 white bristles. Thorax. Pronotum with grey tomentum, mesonotum with yellowish tomentum with black paramedian stripe, at the base with a stripe



Plates 27–28. *Stiphrolamyra albibarbis* Engel, male. 27: Dorsal view; 28: Lateral view.

29



30



Plates 29–30. *Trichardis leucocoma* (van der Wulp), male. 29: Dorsal view; 30: Lateral view.



Plate 31. *Leptogaster arabica* Bosák & Hradský nov. spec., male.

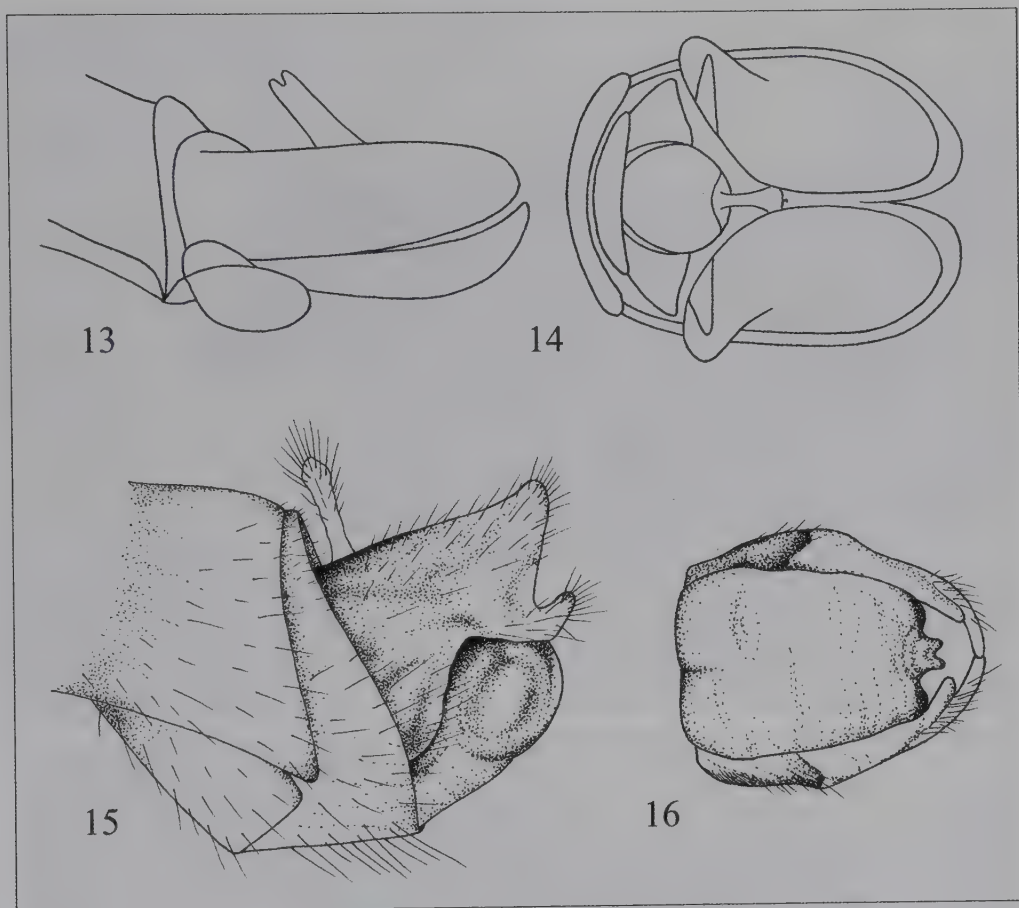
with a negligible black tongue. Dark black spots located both in front of and behind transverse suture. Pleura and scutellum grey dusted. Wings pellucid, veins brown-black, all marginal cells open, with greenish surface shine. Legs. Front and middle coxae grey, femora, tibiae and tarsi yellow. Hind coxa and trochanter yellow dusted. Femora yellow on apex, with a black spot in the widest part and a black line visible on the inner side of femur. Tibiae yellow, black in distal half. Tarsi yellow, 5th tarsomere dark, black. Legs with white hairs, hind femora dorsally with fine black hairs. Claws and empodium black. Abdomen. Tergites 1–3 yellow basally, brown apically, remaining abdominal tergites with a dark brown dorsal stripe. Hypopygium. Epandrium and gonocoxite yellow-brown, hypandrium dark brown, proctiger grey-dusted with fine white hairs.

Female as male.

Remarks: The anatomy of male terminalia is completely different to that of so far described species. Dikow, with whom the material was discussed, commented: "This species is related to some species from the New World, i.e., USA: *L. virgata* Coquillett, 1904, *L. arborcola* Martin, 1957, *L. texana* Bromley, 1934, and the eastern Palaearctic Region, i.e., Taiwan: *L. longicauda* Hermann, 1917. All these species share the particular shape of the divided surstylus on the epandrium with a long ventral lobe and a shorter dorsal lobe. I am sure that there are many more species to be found in this group".

Members of the genus *Leptogaster* occur in herbaceous, especially grassy habitats. The newly described species was collected in a wadi with just sporadic herbaceous vegetation. No more information concerning its biology is available.

Distribution: Palaearctic: UAE.



Figures 13–16. 13–14. *Leptogaster arabica* Bosák & Hradský nov. spec., male terminalia. 13: Lateral view; 14: Ventral view. 15–16. *Leptogaster deserticola* Bosák & Hradský nov. spec., male terminalia. 15: Lateral view; 16: Ventral view.

Etymology: The species name '*arabica*' refers to the Arabian Peninsula, where it was collected.

***Leptogaster deserticola* Bosák & Hradský nov. spec.**

Plates 32–34, Figures 15–16

Specimens examined: Holotype: ♂, United Arab Emirates, Hamranyah env. [25°35'N 55°60'E], 2–7.iv.2009, hand-collected, leg. J. Bosák (JBC). Paratypes: 4♂, 7♀, same data as holotype.

Description: Male. Head. Ocellar tubercle and occiput silvery dusted with silvery-brown median occipital sclerite. 1st and 2nd antennal segments yellow-brown, 3rd dark-brown, stylus yellow-brown. Occipital setae white, short. Palpus brown, proboscis black with short, white setae on apex. Striking facial gibbosity, creating a triangular 'nose', covered with thick, short white-silver hairs. Striking, longer bristles absent. Thorax. Mesonotum with brown-grey tomentum and with black-brown paramedian stripe terminated in 2/3 of the length of thorax. Postalar callus, postalar wall and scutellum with white-silver tomentum. All thorax and



Plates 32–33. *Leptogaster deserticola* Bosák & Hradský nov. spec. 32: Male; 33: Female.



Plate 34. *Leptogaster deserticola* Bosák & Hradský nov. spec., head.

scutellum with short white-yellow setae. Pleura with white-silver tomentum and with long, white hairs on anepisternum. Halteres yellow. Wings clear with yellow-brown veins. Legs. Coxae yellow with white-silver tomentum, femora 1+2, tibiae 1+2 and tarsi yellow, only 5th tarsomere dark on apex. Hairs and setae white. Hind femora light yellow on base, in apex widely dilated with a transversal dark brown spot, strikingly paler towards margins. White pubescence on femora. Hind tibiae dilated approximately from half their length, in distal half white-yellow, in the apical part dark brown. Pubescence of light parts white, that of dark parts brown. Metatarsus white-yellow, other segments light brown. All claws and empodia black. Abdomen. First tergites with silver, other with brown-silver tomentum, sternites with silvery tomentum. Abdomen with very short, white hairs, without striking dark pattern. Just individual tergites separated with a dark 'suture', which is not covered with pubescence. Hypopygium yellow-brown, fine white hairs. Epandrium with a striking excision creating two long prominences. Female as male.

Remarks: The peculiar configuration of the mystax, with dense setae covering it, is known not only in the new species but also in three described species of *Leptogaster*, which are *Leptogaster lanata* Martin, 1957, from the USA; *Leptogaster aganniphe* Janssens, 1957, from Namibia, South Africa, and Zimbabwe; and *Leptogaster tomentosa* Theodor, 1980, from Israel. The male genitalia are strongly reminiscent of *Leptogaster lanata* and another undescribed Afrotropical species. However, this undescribed species from the Afrotropical region does not have the particular mystax setation (Dikow, personal communication).

Members of the genus *Leptogaster* occur in herbaceous, especially grassy growths. The new species was collected on sandy dunes with sparse herbaceous vegetation. Insects were collected individually when flying among grass tufts.

Distribution: Palaearctic: United Arab Emirates.

Etymology: The species name '*deserticola*' refers to the habitat type where it was collected.

Subfamily **Ommatiinae** Hardy, 1927

Genus *Ommatius* Wiedemann, 1821

The genus *Ommatius* is very uniform with a large number of species distributed in all biogeographical regions. The distribution centre of the genus is located in the southern Hemisphere. In the Palaearctic region the genus is represented by 7 species, including the new one described below. In the Afrotropical region there are more than 100 species. The most important works for identification of the Palaearctic species are those by Efflatoun (1934) and Richter (1960, 1976). For the Afrotropical species the studies of Scarbrough (2002, 2003), Scarbrough & Marascia (2000, 2003) and Scarbrough, Marascia & Hill (2003) can be used.

Ommatius tenellus van der Wulp, 1899

Plates 35–36

Specimens examined: Al-Ajban, 5♀, 10–17.x.2005, MT; 17♀, 22.x–9.xi.2005, MT; 1♀, 28.xii.2005–29.i.2006, LT & MT; 1♀, 26.ii–2.iv.2006, MT; 1♀, 25.ii–19.iii.2006, MT; 1♀, 19–25.iii.2006; 2♀, 25.iii–2.iv.2006, MT; 10♀, 1.iv–2.v.2006, MT; 6♂, 26♀, 9.iv–2.v.2006, MT; 3♀, 22–29.v.2006, MT; 2♂, 9♀, 5–12.vi.2006, MT; 2♂, 12–19.vi.2006, MT; 2♀, 19–26.vi.2006, MT; 2♀, 5.vii–21.viii.2006, MT; 7♀, 7–28.xii.2006, LT & MT. Bithnah, 9♂, 19♀, 4–29.vii.2006, LT; 2♂, 3♀, 12.viii–9.ix.2006, MT. Sharjah Desert Park, 1♀, 31.v–30.vi.2005, LT; 1♂, 20.x–24.xi.2007, LT; 1♀, 1–6.iv.2008, LT; 1♀, 6–30.iv.2008, LT; 1♂, 30.iv–25.v.2008, LT; 2♀, 25.v–16.vi.2008, LT; 1♂, 16.vi–15.vii.2008, LT. Wadi Bih dam, 1♂, 30.iv–4.vi.2008, LT. Wadi Madaq, 1♀, 4–15.ii.2006, WT. All specimens AvH.

Remarks: The species was described by van der Wulp on the basis of material from the southern part of the Arabian Peninsula. The data on its wide distribution may be biased by inaccurate identification of the material belonging to the species-rich genus *Ommatius*.

Distribution: Afrotropical: Senegal, Niger (?), Chad, Ethiopia (?), Yemen. Palaearctic: Algeria, Sudan, Egypt, Israel, Transcaucasus, China (?), Iran (?). Oriental: India (?). New to the UAE.

Ommatius spec.

Plates 37–38

Specimens examined: Al-Ajban, 1♀, 22.x–9.xi.2005, MT, AvH. N of Ajman, 1♀, 21.ix–25.x.2007, WT, AvH.

Remarks: Probably a yet undescribed species. The material was compared with Palaearctic species *O. tenellus* Wulp, 1899, *O. striatus* Efflatoun, 1934, *O. stackelbergi* V. Richter, 1960, and *O. tibialis* Ricardo, 1903. All mentioned species show the same shape of the antennal postpedicel, which is short, round, as long as the pedicel. *Ommatius* spec. varies from the species mentioned above by the fact that the postpedicel is strikingly long, lanceolate.

Distribution: Palaearctic: UAE.

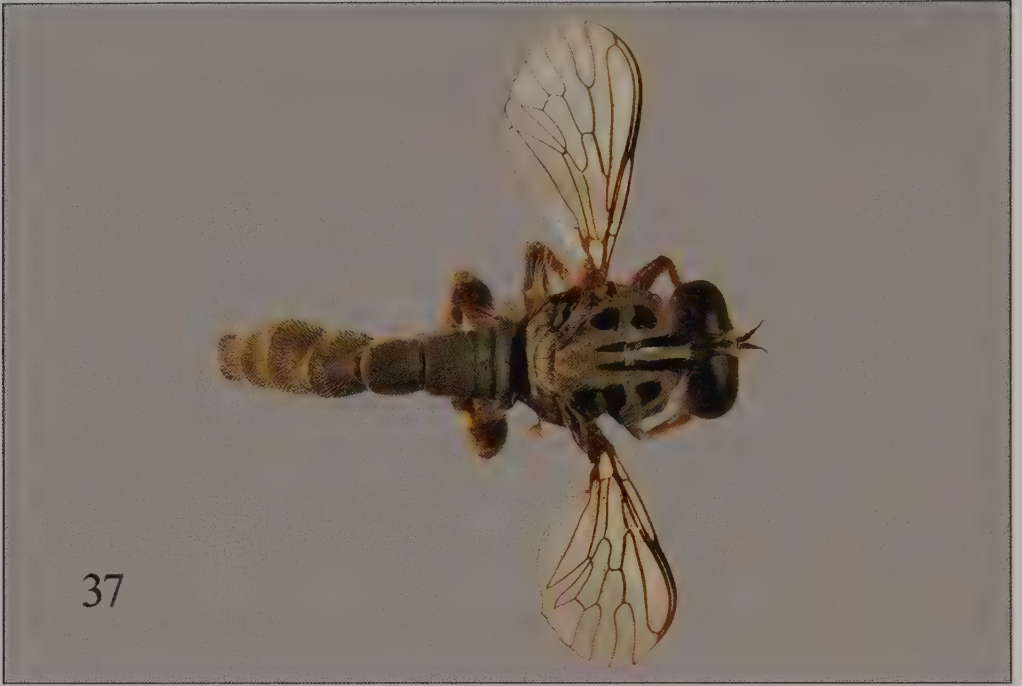
Subfamily **Stenopogoninae** Hull, 1962

Genus *Amphisbetetus* Hermann, 1906

A rather uniform genus comprising 11 described species. Altogether 7 species (including the one described below) occur in the Palaearctic region, 4 remaining species were described



Plates 35–36. *Ommatius tenellus* van der Wulp. 35: Dorsal view; 36: Lateral view.



Plates 37–38. *Ommatius* spec., female. 37: Dorsal view; 38: Lateral view.

from Australia (Tomasovic & van de Meyer, 2008). As to whether or not the latter species really belong to the genus *Amphisbetetus* remains uncertain. This genus would need a thorough revision because of the existence of several taxonomically non-evaluated forms, especially from the Mediterranean area.

***Amphisbetetus hermanni* Bosák & Hradský nov. spec.**

Plates 39–40, Figures 17–19

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Bih [25°48'N 56°04'E], 29.iii.2008, hand-collected, leg. J. Bosák (JBC). Paratypes: 42♂, 48♀, same data as holotype, leg. J. Bosák & M. Hradský; 3♂, 7♀, same locality but 2–7.iv.2009, HC, leg. J. Bosák.

Description: Male. Head. Frons with grey tomentum, face slightly exserted, mystax white, ocellar and postocellar setae stiff, white. Occipital hairs delicate, white. Palpal setae white. Antennae black, scape twice as long as pedicel. Pedicel rounded, postpedicel narrow and twice as long as both basal segments together, stylus short with blunt tip, shorter than the length of scape. Thorax black, with grey tomentum. Antepnotum dark with white hairs. Medial stripe of scutum with grey tomentum, light stripe with one row of stiff white acrostichal setae on its margin. Paramedial stripe black, terminating in the centre of postsutural area. Presutural area with a dark shiny spot closer to transverse suture. Postsutural area with black shiny subtriangular spot. Scutellum grey dusted with fine white hairs. Two white posthumeral bristles, 1 white notopleural bristle, 2 white supraalar bristles; dorsocentral bristles white, long, longer than length of postpedicel. Pleurae with white tomentum, anepisternum entirely grey dusted, with white setae. Katatergal setae white, glassy. Legs with grey tomentum and fine, white hairs. Coxae dark, grey tomentose, all femora black with red apices, all tibiae red, tarsi with grey tomentum, 5th tarsomere dark. Tarsi with black hairs ventrally. Empodium black, pulvilli light yellow. Wings clear, costa basally yellow, subcosta and humeral cross-vein entirely yellow. Other veins black. Marginal cells open, only posterior cubital cell closed by a short connecting vein. Halteres yellow. Abdomen. Tergites grey tomentose with black ornaments, 6th–7th segments only with tomentum. Grey margin of tergites with white hairs. Sternites with grey tomentum and delicate, white hairs. Hypopygium black, with dense white hairs. Hypandrium long, slender, terminally with bristles and fine hairs.

Female as male, only abdomen with less striking ornaments on 1st–4th tergites, 5th–8th tergites with grey tomentum. Female terminalia with dark acanthophorite spurs.

Size: 4–6 mm.

Remarks: The genus *Amphisbetetus* comprises several more or less similar species. Their determination is possible on the basis of, among other characters, leg colouration and the pattern on the thorax. Important determination characters are the male hypandria and gonocoxites. The new species can be confused mainly with *A. dorsatus* Becker, 1913, from which it differs by its expressive colouration and the smaller number of dark spots on the mesonotum. *A. dorsatus* has 6 spots, *A. hermanni* just 4. Three further species of this genus occur in the area: *A. favillaceus* Loew, 1856, *A. rauzi* Theodor, 1980, and *A. gederati* Efflatoun, 1937. The hypandria of all these species are oval, without an excision when viewed from below. The new species has a characteristic bent hypandrium. The margin of the hypandrium creates centrally an excision in the body of the hypandrium.

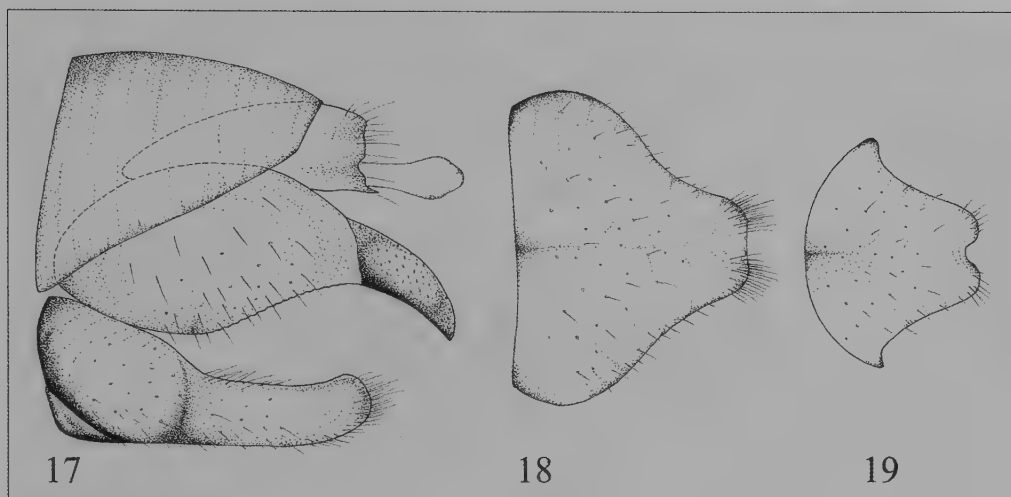
This species was very abundant on a narrow strip of low, dry herbaceous vegetation situated between the foot of a rocky hill without vegetation and trees of one of the farms situated in the area of Wadi Bih dam. Surprisingly, the species was not found in the vegetation under trees.

Distribution: Palaearctic: UAE.

Etymology: The species is named in honour of the author of the genus, Friedrich Hermann.



Plates 39–40. *Amphisbetetus hermanni* Bosák & Hradský nov. spec.



Figures 17–19. *Amphisbetetus hermanni* Bosák & Hradský nov. spec., male terminalia. 17: Lateral view; 18: Hypandrium; 19: Hypandrium (frontal view).

Genus *Habropogon* Loew, 1847

The genus *Habropogon* contains 44 species and one subspecies distributed in the Palaearctic and Afrotropical regions (37 species and 1 subspecies in the Palaearctic region). Within the genus there is a clearly defined group named *Habropogon appendiculatus*-group, which is characterized by the presence of lanceolate or ribbon-shaped appendages on the praetarsomeres of the mid legs of males. The females of most of the species of the *Habropogon appendiculatus*-group are morphologically very similar, lacking distinct diagnostic characters. A revision of the Palaearctic species of this group, including the key, was published by Hradský & Geller-Grimm (2005). A new, western European species was subsequently described by Bosák & Hradský (2008). The group *Habropogon appendiculatus* is also represented by three species in the Afrotropical region (Londt, 2000).

Habropogon bussinowi Bosák & Hradský nov. spec.

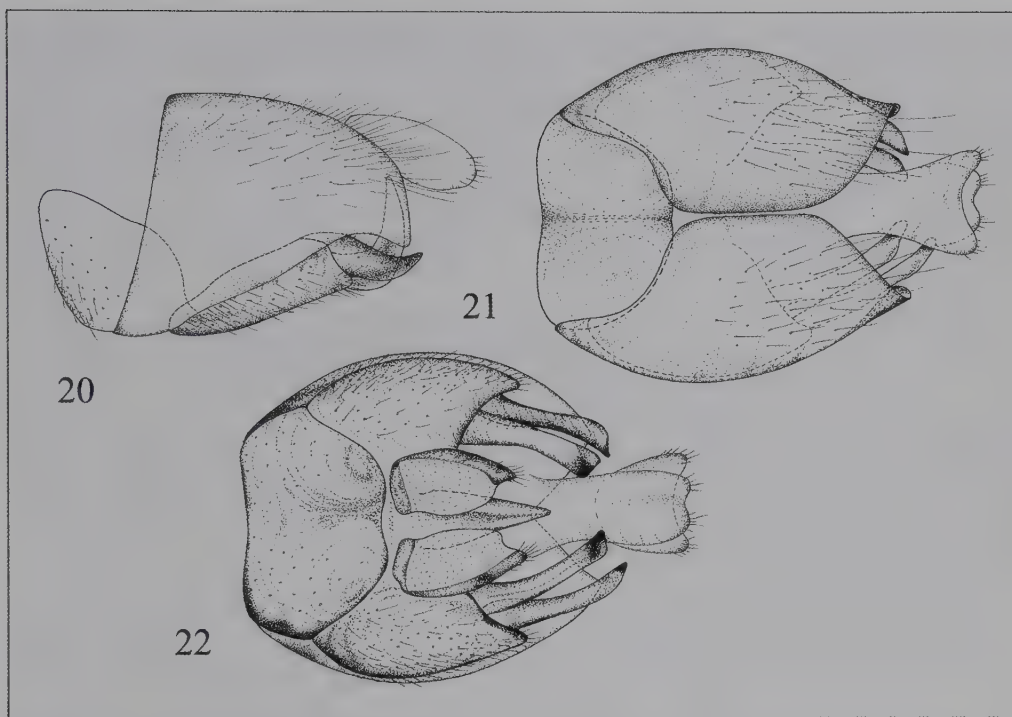
Plates 41–42, Figures 20–22

Specimens examined: Holotype: ♂, United Arab Emirates, Khor Fakkan [25°19'N 55°20'E], 31.iii–3.iv.2008, hand-collected, leg. J. Bosák (JBC). Paratypes: 4♂, 1♀, same data as holotype.

Description: Male. Head. Frons and face with silvery-grey tomentum, frons at margin of eye with white hairs. Ocellar tubercle black and slightly exceeding the eye level. Ocellar setae white. Postcranium silvery dusted with white postocular setae. Mystax dense, shiny white, widely distributed in the lower third of the face. Its distance from antennae equals the length of basal antennal segments. Antennae. Scape and pedicel segment red-brown, scape as long as pedicel. Scape with strong, white bristles. Pedicel basally narrow, apically with white setae, postpedicel longer than scape and pedicel together, dark brown to black. Arista very short, negligible. Proboscis black, palpus dark with numerous white setae. Thorax. Pronotum anteriorly silvery-grey dusted with white hairs. Presutural area of scutum with grey medial stripe between brown central stripes of scutum. Posthumeral tomentose area slightly brown dusted, presutural spot dark brown, postsutural area with two dark brown spots. Humeral callus silvery-grey dusted. One notopleural bristle, 2 supraalar, 4 postalar setae and



Plates 37–38. *Habropogon bussinowi* Bosák & Hradský nov. spec., male. 37: Dorsal view; 38: Lateral view.



Figures 20–22. *Habropogon bussinowi* Bosák & Hradský nov. spec., male terminalia. 20: Lateral view; 21: Dorsal view; 22: Ventral view.

4 dorsocentral setae ending at transverse suture. Scutellum silvery-grey tomentose and with 6 light yellow marginal setae. Pleurae with silvery-grey tomentum, katatergal setae white-yellow. Halteres vaguely yellow. Wings clear, yellow basally, veins dark, brown-black. All marginal cells open. Legs. Coxae with grey tomentum and with white hairs. Femora basally black, apically brown-yellow. Tibiae of front and middle legs brown-yellow, with apex somewhat infuscate, tibiae of hind legs yellow with longitudinal black stripe. Tarsal segments dark brown, 5th tarsomere black. Fifth tarsomere of midleg with 6 striking long appendices. Claws black with base yellow, pulvilli and empodium yellow-white. Abdomen. Tergites and sternites with silvery-grey tomentum and short, white hairs. First to third tergites with dense, long bristles. Male terminalia: epandrium brown, as wide as long. Cerci not unusual in any way, short. Hypandrium flat. Female as male, only its colouration less striking. Acanthophorite spurs black.

Size: 8–11 mm.

Remarks: *Habropogon bussinowi* belongs to the group of species close to *Habropogon appendiculatus*. From other species of the group it differs by the dull brown colour of the whole body of males. Males of other representatives of the group have a part of the abdomen red, or they are completely dark to black (*H. aegyptius* Efflatoun, 1937). Another striking character is the shape and colour of appendices on the 5th tarsomere of the mid legs. In the case of *H. bussinowi* the appendices are light to pellucid, the same as in the case of the rest of the species, with the only exception of *H. aegyptius*, with black appendices. However, the appendices of *H. bussinowi* are narrow and long (longer than wider). A similar shape only

occurs in *H. appendiculatus* Schiner, 1867 – males mostly with red abdomen, femora of the middle pair of legs are brown-black, and in *H. theodori* Hradský & Geller-Grimm, 2005 – males with red abdomen, femora of the middle pair red. *H. bussinowi* has a brown abdomen, femora of the middle pair are dark, brown-black. From the African species only *H. namibiensis* Londt, 2000, possesses slender appendices. In the case of that species the appendices are extremely narrow.

The species was found on a stony site covered with woody vegetation and low bushes. The insects occurred individually in the vicinity of the low bushy vegetation, where they looked for shelter when disturbed.

Distribution: Palaearctic: UAE.

Etymology: The species is named after our colleague Milan Bussinow for his help with the preparation of the English manuscript.

***Habropogon aegyptius* Efflatoun, 1937**

Plates 43–44

Specimens examined: Near Hamraniyah, 1♂, 2–7.iv.2009, HC, leg. J. Bosák.

Remarks: A minute species escaping attention. Most probably it occurs in suitable habitats in the entire Arabian Peninsula.

Distribution: Palaearctic: Egypt, Israel, Jordan. New to the UAE.

Genus *Sisyrnodytes* Loew, 1856

The genus *Sisyrnodytes* is distributed in the Afrotropical and Palaearctic regions. It includes a total of 18 known species, 15 in the Afrotropical region and the remaining 4 in the Palaearctic region, especially in northern Africa. *S. nilicola* occurs in both the Palaearctic and Afrotropical regions. The northernmost distributed species of the genus are *S. engeddensis* Theodor, 1980 (Israel) and *S. nilicola* (Rondani, 1850), also known from northern Africa, Yemen, Israel and the former Soviet Central Asia. The species described below is only the third taxon found outside the African distribution centre of the genus. The genus *Sisyrnodytes* is characterised by the absence of pulvilli and a striking sexual dimorphism manifested especially by either presence or absence of abdominal pubescence and its colour. Revisions of the genus were published by Oldroyd (1956) and Londt (2009).

***Sisyrnodytes editae* Bosák & Hradský nov. spec.**

Plates 45–47, Figures 23–24

Specimens examined: Holotype: ♂, United Arab Emirates, Khor Fakkan [25°19'N 55°20'E], 31.iii–3.iv.2008, hand-collected, leg. J. Bosák (JBC). Paratypes: 1♂, 6♀, same data as holotype.

Description: Male. Head. Antennae black with white setae on scape and pedicel. Setae very long, as long as postpedicel. Mystax white, facial and ocellar bristles white, postocular bristles white with several brown, occipital and lower occipital bristles white. Palpi black with white hairs, proboscis brown-black with white bristles. Thorax completely black, pronotum, prescutum and scutum with long white hairs. Scutellum with long, white bristles on margin. Proepisternal and postpronotal bristles white. Anepisternum shiny black without bristles. Katatergal bristles dense, long, white. Halteres hyaline, yellow with darker (brown) stalk. Wings clear, veins brown, not reaching lower wing margin. Legs black. Coxal bristles white, behind coxa with a few black bristles. Femora with white bristles. Front and middle tibiae with white hairs, some of them approx. 3 times as long as others. Hind tibiae with white bristles and few stronger black bristles and small black hairs. Front and middle tarsi with white and black bristles, hind tarsus with black bristles only. Claws black, pulvilli absent. Abdomen black, 1st tergite with white setae in length not exceeding the width of the tergite. Second tergite with small black-brown setae anteriorly, with longer white setae posteriorly.



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Plates 39–40: *Habropogon aegyptius* Efflatoun, male. 39: Dorsal view; 40: Lateral view.



Plates 41–42. *Sisyrnodytes editae* Bosák & Hradský nov. spec., male. 41: Dorsal view; 42: Lateral view.



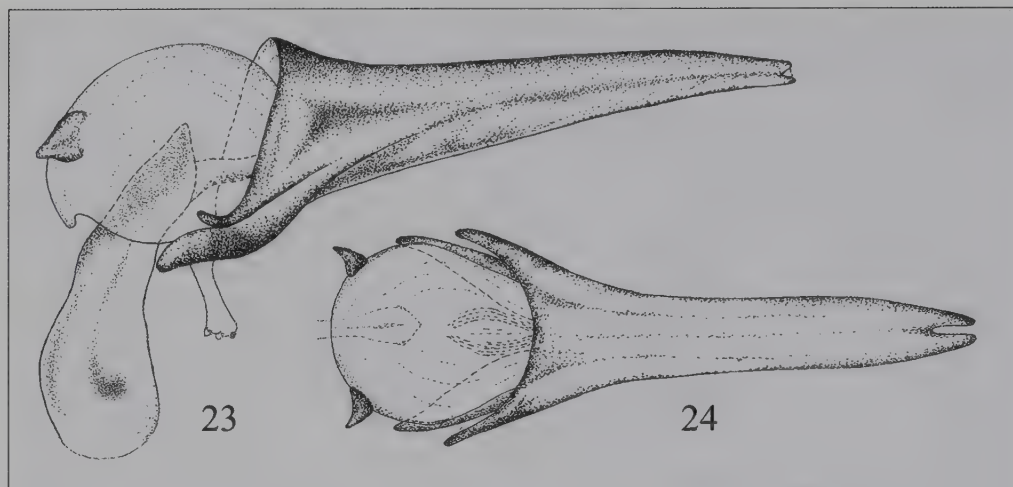
Plate 47: *Sisyrnodytes editae* Bosák & Hradský nov. spec., female, dorsal view.

Other tergites with long, dense white hairs. Sternites black with few, yellow-brown, thin long hairs. Male terminalia very small, dark, completely covered with long, white hairs. Aedeagus strong and straight.

Female. Head. Antennae black, scape and pedicel with yellow-brown long bristles. Mystax yellow, facial and ocellar bristles white, postocular bristles strong, light brown and yellow, occipital bristles yellow, lower occipital bristles white, palpi black with white-yellow bristles, proboscis brown-black with white bristles. Thorax completely black, anteprenotal bristles white, postpronotal bristles yellow-brown, scutum with long, white hairs and yellow-brown hairs and bristles on margin, all directed posteriorly. Scutellum with strong, yellow-brown bristles on margin. Anepisternum shiny black and bare, katatergal bristles dense, long, yellow-brown. Halteres yellow-brown with darker stalk. Wings hyaline, veins brown, not reaching the posterior wing margin and their terminal part colourless. Legs black. Front and middle coxae with white, hind coxae with white and black bristles. Femora and tibiae with white bristles. Tarsi with black bristles, middle and front tarsi also with white, and hind tarsi with black bristles. Abdomen black. Tergites with small brown-black bristles. Posterior margin of tergites with long white bristles. Sternites with few long white hairs. Female terminalia without acanthophorite spurs.

Size: 6–8 mm.

Remarks: The new species differs from the Palaearctic species by the colour of the legs, being black both in males and females. Legs of other species are mostly red.



Figures 23–24. *Sisyrnodytes editae* Bosák & Hradský nov. spec., male aedeagus. qa: Lateral view; qb: ventral view.

The species was collected in a dry wadi with scattered woody vegetation and low bushes. It was not abundant. Individuals sat on rocks or bare ground.

Distribution: Palaearctic: UAE.

Etymology: The species was named in honour of the first author's wife, Edita Bosáková, for her tolerance and patience.

Genus *Wadipogon* Bosák & Hradský nov. gen.

Type species: *Anisopogon parvum* Efferlatoun, 1937: 378–381, here designated.

Efferlatoun (1937) described two new species of asilids from Egypt which he included in the genus *Anisopogon* von Röder, 1881, viz. *A. pulchrum* Efferlatoun, 1937, and *A. parvum* Efferlatoun, 1937. His detailed descriptions were accompanied by excellent colour illustrations. However, both these species morphologically did not agree with the genus *Anisopogon*. The latter genus can be recognized by its size (about 12 mm), long abdomen and rather short wings and long legs. However, the above species described by Efferlatoun (l.c.) - are minute, compact flies, 3–9 mm long. Having studied the material deposited in our collections we reached the conclusion that a new genus – *Wadipogon* nov. gen. – has to be established for the two species described by Efferlatoun from Egypt and a new species described here from the UAE. Consequently: *Wadipogon pulchrum* (Efferlatoun, 1937) **nov. comb.** and *Wadipogon parvum* (Efferlatoun, 1937) **nov. comb.**

Generic diagnosis: Small to very small flies, usually with hyaline wings and moderately humped (anteriorly) thorax. Normal bristly hairs. The genus combines the following characters:

- 1) Head 2.5 times as wide as high;
- 2) Face dusted with a single row of mystacial setae on lower facial margin;
- 3) Facial tubercle small, only on lower facial margin;

- 4) Antenna: Scape small, pedicel slightly thicker than scape, postpedicel long, longer than scape and pedicel together, lanceolate, arista as long as pedicel, antennae with only normal bristly hairs on pedicel;
- 5) Thorax rather arched, chaetotaxy not well developed;
- 6) Scutellum dusted with fine pale discal scutellar setae;
- 7) Wings clear, pale, with normal venation. cell r1 open;
- 8) Abdomen with contrasting patterns from tomentum, very long setae only on 1st tergite, other tergites only with very short hairs;
- 9) Male terminalia compact, round, without striking appendices or other external structures; female terminalia with acanthophorite spurs, 8th abdominal sternite (hypogynial valve) very well developed, without bristles or hairs.

Ethymology: To create a name for the new genus we used the term of the periodic, almost all-year-round dry river beds – wadi's – in which all three known species were collected.

***Wadipogon pulchrum* (Efflatoun, 1937)**

Plate 48

Specimens examined: Hatta, 14♂, 6♀, 8–26.iv.2006, LT; 2♂, 4♀, 17–24.v.2006, LT; 19♂, 20♀, 24–30.v.2006, LT; 4♂, 14–21.vi.2006, LT; 38♂, 24♀, 17–24.viii.2006, LT; all AvH. Wadi Madaq, 1♀, 6–13.v.2006, LT, AvH.

Remarks: Species was so far only known from Egypt. However, its distribution in dry areas of northern Africa and the Arabian Peninsula will probably be much larger. Due to its small size (7 mm) it probably escapes attention.

Distribution: Palaearctic: Egypt. New to the UAE.

***Wadipogon szpilai* Bosák & Hradský nov. spec.**

Plate 49, Figure 25

Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Wurayah [25°24'N 56°17'E], 12–14.iv.2005, in Malaise trap, leg. T. Pape (MHC). Paratype: 1♀, Wadi Madaq, at light, leg. A. van Harten, T. Pape & K. Szpila.

Description: Female. Head. Face light, yellowish, grey dusted. Antennae dark, scape and pedicel with fine pale hairs, postpedicel as long as scape and pedicel together. Arista half as long as postpedicel, terminally pale. Vertex with sparse pale hairs. Thorax with grey tomentum and light yellow hairs, black hairs only marginally. Pleurae with grey tomentum. Katatergal setae light, whitish. Halteres dark with white knob. Wings slightly brownish. Veins brown, except a striking whitish part of M, transparent in a short segment just in front of discal cell. Legs. Femora of front and medium legs with outer side dark, inner side yellow, femora of hind legs red-yellow, tibiae and tarsi dark. Hairs and bristles of legs white and black. Abdomen grey dusted with a blue shade and broad shiny black spots of characteristic shape. Abdomen with white hairs. Eighth tergite black, shiny, with black acanthophorite spurs. Eighth sternite red-brown with pale hairs on margin.

Male unknown.

Size: 7–9 mm.

Remarks: The species can be easily distinguished by its pristine-white medial segment of vein M. No information concerning the species' biology is available. It is probably widely distributed in arid areas of the Arabian Peninsula.

Etymology: The new species is named after one of its collectors, Krzysztof Szpila from Toruń University in Poland.

Distribution: Palaearctic: UAE.



Plates 48–49. 48: *Wadipogon pulchrum* (Efferlatoun), male, dorsal view; 49: *Wadipogon szpilai* Bosák & Hradský nov. spec., female, dorsal view.

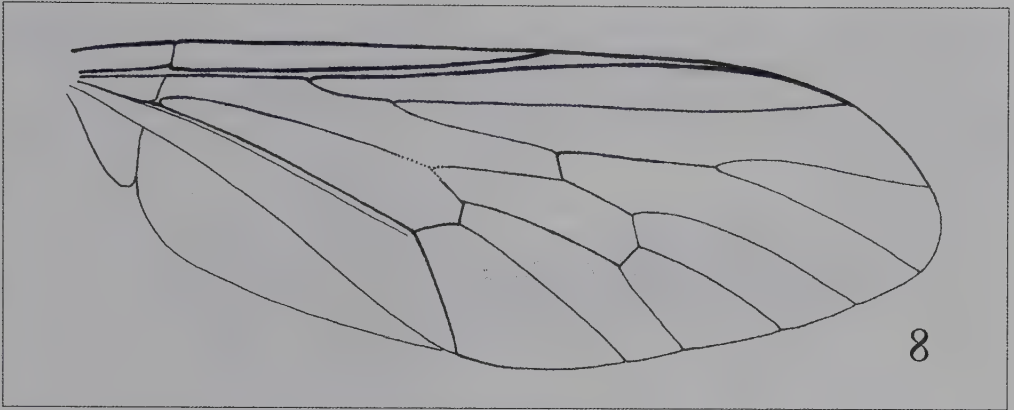


Figure 25. *Wadipogon szpilai* Bosák & Hradský nov. spec., wing.

Genus *Dichropogon* Bezzi, 1910 **stat. nov.**

Type species: *Stichopogon schineri* Koch, 1872

The genus *Stichopogon* was previously divided into several subgenera. However, some authors disallowed these subgenera and included all species in the genus *Stichopogon* s.l. In our opinion this broad concept is incorrect. We are sure that some species differ to such an extent that their placement in separate genera is justified. At least in the case of *Dichropogon* Bezzi, 1910, we consider it legitimate to rank this subgenus as genus. The following characters are most diagnostic to distinguish this genus from other genera of the subfamily Stichopogoninae: Dark to black, minute species, having both males and females of the same colour. Head narrow, mystax and head pubescence dark to black. Third medial cell without stem and open in wing margin. A more detailed diagnosis of the genus is given by Hull (1962). In addition to the new species described below, we consider the following species to belong to *Dichropogon*: *D. schineri* (Koch, 1872) **nov. comb.**, *D. canariensis* (Becker, 1908) **nov. comb.**, *D. pusio* (Macquart, 1849) **nov. comb.** and *D. caucasicus* Bezzi, 1910.

Dichropogon tenebrosus Bosák & Hradský **nov. spec.**

Plate 50, Figures 26–28

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Shawkah [25°06'N 56°02'E], 31.x–27.xi.2006, in water trap, leg. A. van Harten (MHC). Paratypes: 2♂, 3♀, same data as holotype.

Description: Dark species, male and female similarly coloured. Male. Head. Eyes nearly touching antennae, narrow gap below dark antennae silvery dusted. Mystax black, ocellus and top of head with black bristles. Thorax dark, dull black, margins in front of and behind transverse suture black, lustrous. Dorsal hairs black. Pleurae with grey tomentum. Katatergal setae light, whitish. Scutellum with grey tomentum. Wings dark, veins black, cell m3 without stem on anterior and open in wing margin. Legs. Femora and tibiae dark with grey tomentum, black bristles and whitish hairs. Tarsi dark, lustrous, with black bristles.

Abdomen. Tergites completely black, on base with narrow, white tomentose stripe. Sternites dark to black. Male terminalia with light tomentum and white hairs.

Female similar to male. Light stripes on bases of tergites wider and more pronounced. Seventh tergite black, 8th with grey tomentum, 8th sternite red-brown with golden hairs. Acanthophorite spurs white.

Size: 5–7 mm.



Plate 50: *Dichropogon tenebrosus* Bosák & Hradský nov. spec., female, lateral view.

Remarks: This species can be confused especially with *Stichopogon angustifrons* Theodor, 1980, which was also described from the Arabian Peninsula. It can be distinguished from that species by having entirely black femora 3. *S. angustifrons* has apically red femora 3. The species was collected at only one site, using water traps. Similarly to other representatives of Stichopogoninae, this species also is most probably geophilic, preferring open ground near grown vegetation. This could explain its absence in the material obtained by means of different types of traps, having the 'collecting device' located higher above ground level.

Distribution: Palaearctic: UAE.

Etymology: The name is derived from the species' dark colour.

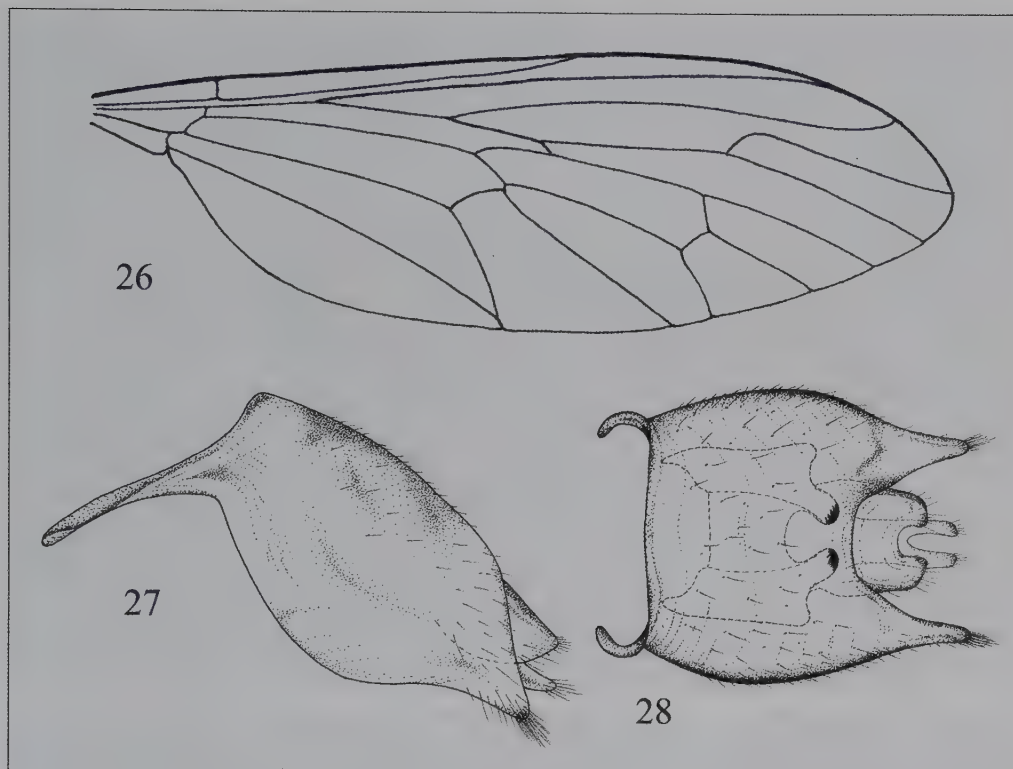
Genus *Rhadinus* Loew, 1856

The genus comprises minute, delicate species (max. 12 mm). One of a few genera characterised by the absence of pulvilli. It is also distinguished by the mystax made up of very strong bristles. The genus is confined to arid regions. The known species are distributed within the Palaearctic region (9 species), with only one species described from the Afrotropical region (from Socotra Island: Geller-Grimm, 2002). Two species are distributed through the Arabian Peninsula into the Afrotropical region – *Rhadinus megalonix* Loew, 1856, and *Rhadinus unguinus* Loew, 1856. The works of Eflatoun (1937), Theodor (1980) and Geller-Grimm (2002) are indispensable for the identification of the species of the genus.

Rhadinus megalonix Loew, 1856

Plates 51–52

Specimens examined: National Avian Research Centre, near Sweihan, 1♀, 9–20.iv.2005, LT, AvH.



Figures 26–28. *Dichropogon tenebrosus* Bosák & Hradský nov. spec. 26: Wing; 27: Male terminalia. epandrium and proctiger, lateral view; 28: Idem, dorsal view.

Remarks: The most widespread species of the entire genus. Distributed in most of northern Africa, over the Arabian Peninsula deep into central Asia. Like other representatives of the genus, this species is also not caught frequently. Apparently, their small size and light colour blending with the background help them to escape attention.

Distribution: Palaearctic: Tunisia, Libya, Egypt, Israel, Syria, Iraq, Turkey, the former USSR, Iran. Afrotropical: Sudan, Yemen. New to the UAE.

***Rhadinus* cf. *socotrae* Geller-Grimm, 2002**

Specimens examined: Al-Ajban, 1♂, 21.viii–19.ix.2006, MT; 1♀, 26.vi–25.vii.2006, MT; all AvH. N of Ajman, 1♂, 1♀, 21.ix–25.x.2007, WT; 1♀, 7–30.viii.2007, WT; 1♀, 10–14.viii.2008, WT; all AvH.

Remarks: In the material examined two females have been found that might belong to this species. However, these specimens are not well preserved – they were partially faded and macerated by the fixation liquid used in traps. *R. socotrae* was described from the island of Socotra (Geller-Grimm, 2002), so it is not impossible that it can be found in the UAE.

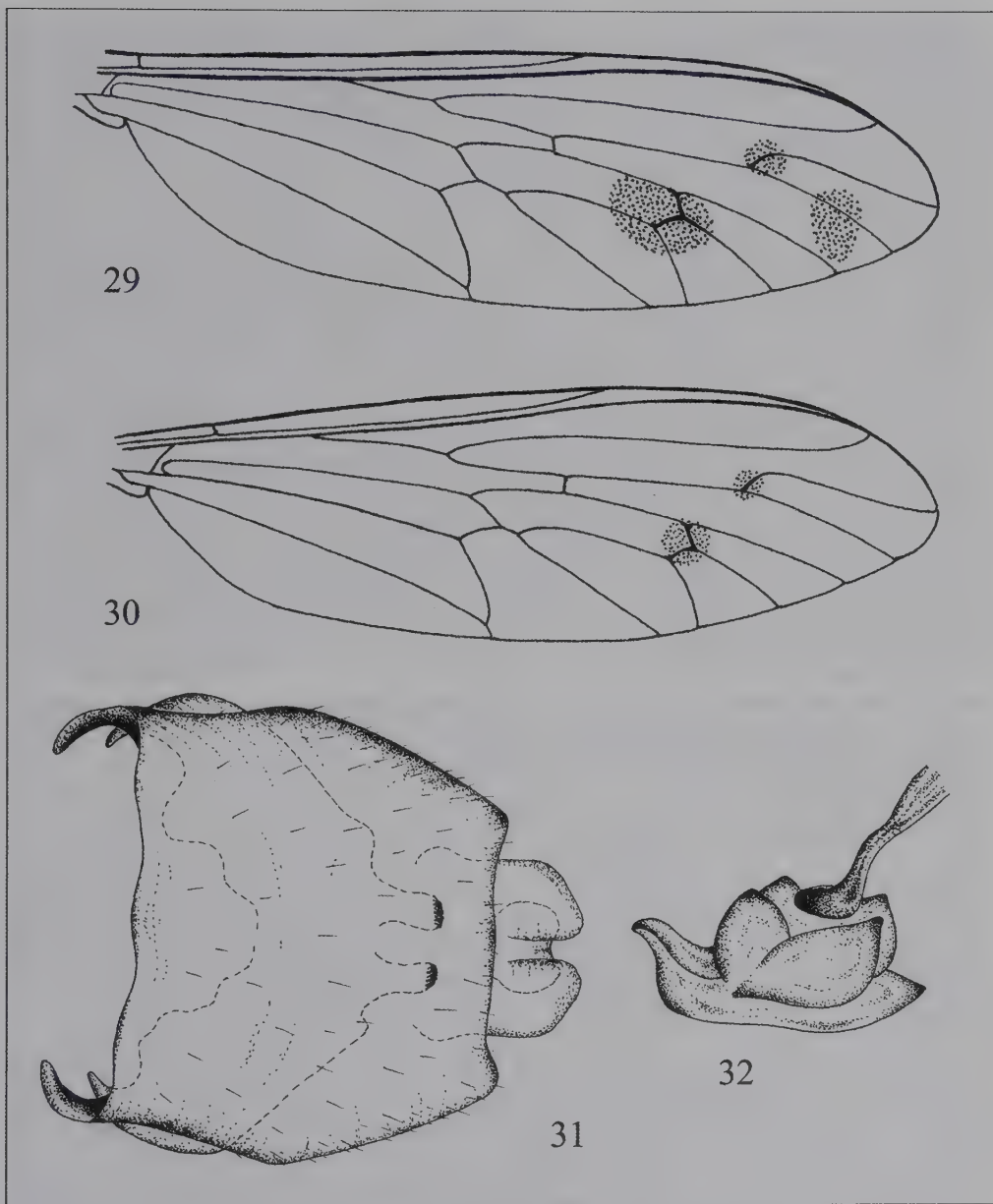
Distribution (of *R. socotrae*): Afrotropical: Socotra. New to the UAE.

***Rhadinus* spec. 1**

Specimens examined: Al-Ajban, 1♀, 22–29.v.2006, MT, AvH. Qurrayah, 2♂, 2♀, 2–7.viii.2008, WT, AvH.



Plates 51–52. *Rhadinus megalonix* Loew, female. 51: Lateral view; 52: Dorsal view.



Figures 29–32. *Rhadinus vanharteni* Bosák & Hradský nov. spec. 29: Wing of male; 30: Wing of female; 31: Epandrium and proctiger, dorsal view; 32: Aedeagus.

Remarks: Specimens belonging to the genus *Rhadinus* are rarely represented in collections. Their identification is often impaired by their rather poor condition, caused by the effect of media used for their preservation.

***Rhadinus vanharteni* Bosák & Hradský nov. spec.**

Plates 53–55, Figures 29–32

Specimens examined: Holotype: ♂, United Arab Emirates, ar-Rafah [25°43'N 55°51'E], 29.iii.2008, hand-collected, leg. J. Bosák (JBC). Paratypes: 4♂, 7♀, same data as holotype; 3♀, 25.iii.2008, HC, leg. J. Bosák & M. Hradský; 5♂, 17♀, 6.iv.2008, HC, leg. J. Bosák. 1♂, 1♀, N of Ajman, 2–7.iv.2009, HC, leg. J. Bosák. 2♀, Near Hamraniyah, 2–7.iv.2009, HC, leg. J. Bosák. 1♂, Khor Fakkan, 30.iii.2008, HC, leg. K. Mahmood. 1♂, 1♀, Sharjah Desert Park, 26.iii.2008, HC, leg. J. Bosák & M. Hradský; 2♀, 1–30.xi.2008, WT, AvH; 1♂, 16.iii.2009, WT, leg. C. Schmid-Egger.

Description: Male. Head with silver tomentum, face gibbosity slightly protruding beyond eye profile. Mystax dense, white, and as long as proboscis. Frons silvery dusted, two long white ocellar setae. Postocular setae light, white. Antennae dark, black with light tomentum. Scape narrow, pedicel rounded, postpedicel long, lanceolate, twice as long as scape and pedicel together. Occiput with grey tomentum, proclinate orbital setae white. Thorax with silver tomentum dorsally and laterally, hairs and bristles light, white-yellow. One notopleural, 2 supraalar, 4 postalar and 1 dorsocentral seta, long. Scutellum with white tomentum and numerous long pale discal scutellar setae. Katatergal setae short, yellow. Halteres yellow. Legs red, hairs light yellow. Claws black, long. Pulvilli absent. Wings with microtrichia, opalising to green, veins yellow, membrane with 3 dark spots. Abdomen. Tergites and sternites with grey tomentum and white hairs. All tergites with central brown spot, forming continuous dorsomedial stripe on abdomen. Margins of tergites slightly darker. Hypopygium with white tomentum. Female as male. Only 2 spots on wings, 1st located on the junction of veins R₄ and R₅, 2nd on veins M2 and medial cross-vein. Eighth sternite red-brown with white hairs. Acanthophorite spurs white.

Size: 2.5–4 mm.

Remarks: This remarkable species varies from all known species by the striking dark spots on the wings of both males and females. The species was very abundant at sandy sites, where it occurred individually in the vicinity of low, bushy vegetation.

Distribution: Palaearctic: UAE.

Etymology: The species is named in honour of one of its collectors, Mr. A. van Harten.

Genus *Stichopogon* Loew, 1847

Figure 33

The genus *Stichopogon* comprises minute species with dusted, dull thorax, and distinctively coloured abdomen – the general colour is brown to black with striking silver or grey-white ornamentation, usually different in males and females. Eyes on frons widely separated. Cell m3 with stem and open in wing margin. A more detailed diagnosis of the genus is given by Hull (1962).

Stichopogon is widely distributed in practically all biogeographical regions. More than 50 species are known from the Palaearctic region, and 15 species from the Afrotropical region. Members of *Stichopogon* are minute dark coloured flies with grey tomentum. In the past also species, which in our opinion belong to the genera *Dichropogon* Bezzi, 1910, and *Turkmenomyia* Paramonov, 1930, were included in this genus. The Afrotropical species were treated by Londt (1979). Works of Efflatoun (1937), Engel (1930) and Theodor (1980) contributed particularly significantly to the knowledge of the *Stichopogon* fauna of the Arabian Peninsula.

***Stichopogon deserti* Theodor, 1980**

Plate 56, Figure 34

Specimens examined: Al-Ajban, 2♂, 4♀, 10–17.x.2005; 32♂, 22♀, 22.x–9.xi.2005; 1♂, 3♀, 28.xii.2005–29.i.2006; 4♂, 2♀, 25.ii–19.iii.2006; 3♂, 1♀, 26.ii–2.iv.2006; 74♂, 27♀, 2.iv.–2.v.2006; 5♂, 22–29.v.2006; 29♂, 6♀, 5–12.vi.2006; 14♂, 12–19.vi.2006; 13♂, 1♀, 19–26.vi.2006; 8♂, 4♀, 26.vi–25.vii.2006; 9♂, 6♀, 25.vii–21.viii.2006; 1♂, 1♀, 7–28.xii.2006; all MT, AvH. N of Ajman, 1♀,



Plates 53–54. *Rhadinus vanharteni* Bosák & Hradský nov. spec. 53: Female, dorsal view; 54: Male, lateral view.

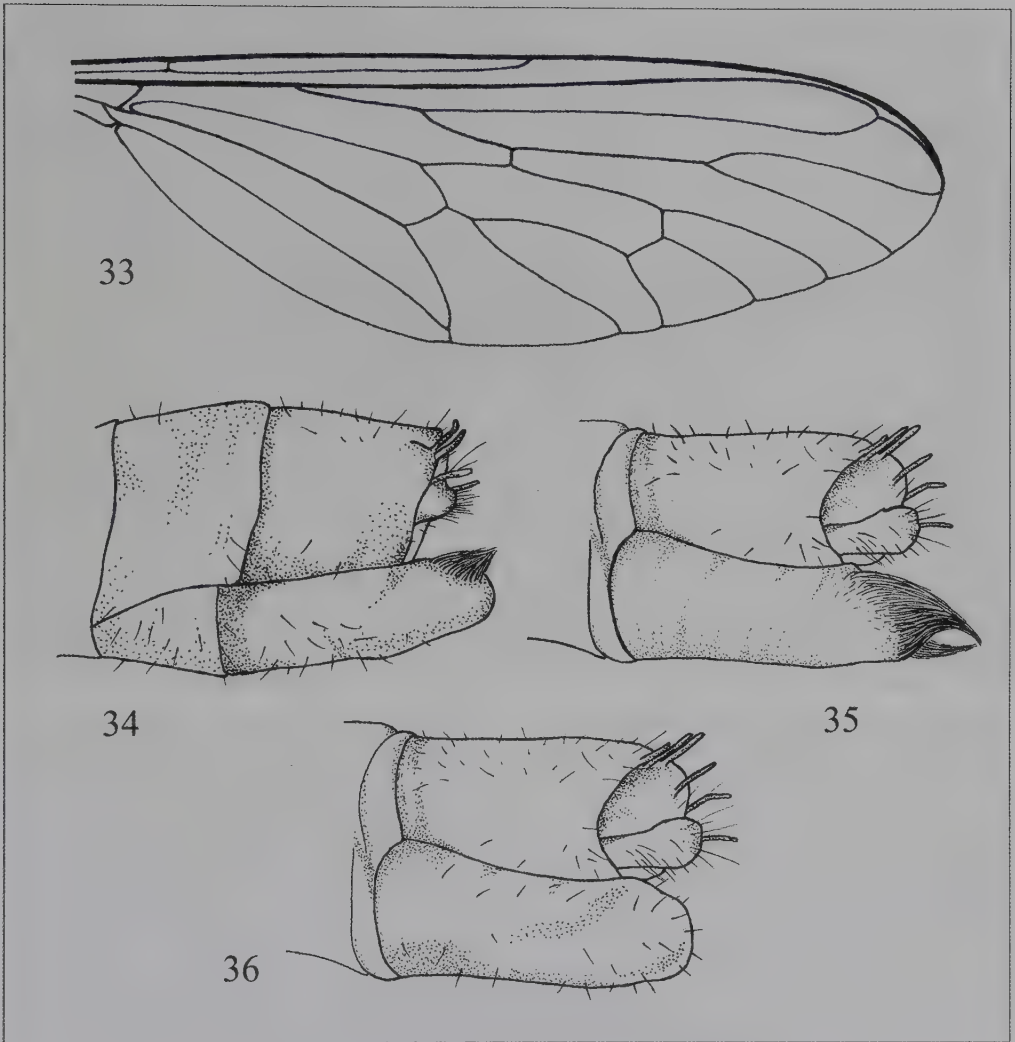


Plate 55. *Rhadinus vanharteni* Bosák & Hradský nov. spec., female.

7–30.viii.2007, WT; 1♀, 25.x.2007, WT; all AvH. Bithnah, 3♂, 8♀, 4.vii–12.viii.2006, MT; 10♂, 7♀, 12.viii–9.ix.2006, MT; 5♂, 3♀, 19.x–16.xi.2006, MT; all AvH. Hatta, 1♀, 24–30.v.2006, LT, AvH. Khor al-Khwair, 1♂, 16–23.v.2007, LT, AvH. Near Mahafiz, 1♀, 4–11.iv.2006, LT, AvH. Sharjah, 1♂, 27.v–5.vi.2005, LT; 1♀, 30.vi–21.vii.2005, LT; 2♂, 28.ix–9.x.2005, LT; all AvH. Sharjah Desert Park, 1♂, 1♀, 29.iii–6.iv.2005, LT; 1♀, 22.iv–5.vi.2005, LT; 1♂, 1♀, 23–30.iv.2005, LT; 2♂, 2♀, 30.iv–31.v.2005, LT; 1♂, 31.v–30.vi.2005, LT; 1♂, 2♀, 30.vi–23.vii.2005, LT; 7♂, 10♀, 6–28.xii.2006, PT; 1♀, 24.xi–22.xii.2007, LT; 4♂, 1♀, 30.iv–25.v.2008, LT; 8♂, 1♀, 16.vi–17.vii.2008, LT; 2♂, 17–24.vii.2008, LT; 7♂, 3♀, 9.viii–4.ix.2008, LT; 1♂, 2♀, 1–30.xi.2008, LT; 3♂, 4♀, 16.iii.2009, LT; all AvH. Sharjah-Khor Kalba, near tunnel, 1♀, 24–30.v.2006, LT, AvH. Wadi Bih dam, 1♂, 24.iv–1.v.2007, LT, AvH; 1♂, 19.ii–1.iii.2008, LT, AvH; 1♀, 25.iii.2008, HC, leg. J. Bosák; 22♂, 12♀, 22–26.iii.2009, LT, AvH. Wadi Madaq, 2♂, 5♀, 4–15.ii.2006, WT; 2♂, 3♀, 29.iii–10.iv.2006, WT; 1♂, 6–13.v.2006, WT; 1♂, 17–24.vi.2006, WT; 1♂, 5♀, 27.vi–29.vii.2006, MT; 1♀, 28.viii–9.ix.2006, WT; 22♂, 32♀, 24.ix–22.x.2006, WT; 3♂, 3♀, 26.x–9.xi.2006, WT; 1♂, 18.xi–15.xii.2007, WT; 1♂, 17.viii–11.ix.2008, WT; 20♂, 2♀, 9–11.iii.2009, WT; all AvH. Wadi Safad, 18♂, 1♀, 26.iv–4.v.2006, LT, AvH; 12♂, 1♀, 14–21.v.2006, LT, AvH. Wadi Shawkah, 4♀, 31.x–27.xi.2006, WT; 1♀, 20.iii.2007, HC; 1♀, 26.iii.2007, HC; 1♀, 19–28.ix.2007, WT; 5♂, 1♀, 17.viii–11.ix.2008, WT; all AvH. Wadi Wurayah, 2♂, 1♀, 17–24.iii.2009, WT, AvH.

Remarks: *S. deserti* Theodor, 1980, is similar to the widely distributed *S. elegantulus* (Wiedemann, 1820), inhabiting almost entire Europe and a large part of Asia. For differences between the two species see Theodor (1980: 53).

Distribution: Palaearctic: Europe, Asia, Israel, Jordan. New to the UAE.



Figures 33–36. 33: Wing of *Stichopogon* spec.; 34–36: Female terminalia. 34: *Stichopogon deserti* Theodor; 35: *Stichopogon chrysostoma* Schiner; 36: *Stichopogon inconstans* (Wiedemann).

***Stichopogon chrysostoma* Schiner, 1867**

Plate 57, Figure 35

Specimens examined: Al-Ajban, 1♂, 3♀, 22.x–9.xi.2005, MT; 1♂, 1♀, 1.iv–2.v.2006, MT; 1♂, 9.iv–2.v.2006, MT; 3♀, 5–12.vi.2006, MT; 1♀, 5.vii–21.viii.2006, MT; all AvH. N of Ajman, 4♀, 16.ix–12.x.2006, WT, AvH; 1♀, 19–22.v.2007, WT, AvH; 3♀, 21.ix–25.x.2007, WT, AvH; 2♂, 1♀, 2–7.iv.2009, HC, leg. J. Bosák. Ar-Rafah, 1♂, 2–7.iv.2009, HC, leg. J. Bosák. Sharjah Desert Park, 1♂, 20.x–24.xi.2007, LT, AvH. Um al-Quwain, 1♀, 25.iii.2008, HC, leg. J. Bosák. Wadi Bih dam, 1♂, 1♀, 2–7.iv.2009, HC, leg. J. Bosák.

Remarks: The species was collected mostly individually in open sandy habitats.

Distribution: Palaearctic: China, Cyprus, Egypt, former Soviet Middle Asia and Far East, Iran, Israel, Kazakstan, Lybia, Mongolia, Turkey. New to the UAE.



Plates 56–57. 56: *Stichopogon deserti* Theodor, female, dorsal view; 57: *Stichopogon chrysostoma* Schiner, female, dorsal view.

Stichopogon inconstans (Wiedemann, 1828)

Plate 58, Figure 36

Specimens examined: Al-Ajban, 1♂, 2♀, 5.vii–21.viii.2006, MT, AvH. SSW of ad-Dhaid, 1♂, 7–14.ix.2006, LT, AvH. Ar-Rafah, 2♀, 29.iii.2008, HC, leg. J. Bosák. Sharjah Desert Park, 3♂, 7♀, 1–30.xi.2008, PT, AvH; 1♀, 16.iii.2009, HC, leg. C. Schmid-Egger.

Remarks: *S. inconstans* is a minute species with golden-yellow mystax and yellow antennae. Wings with veins that are yellowish in basal part. Legs entirely yellow except for 5th tarsal segment, which is as dark as claws. Females differ from other members of the genus *Stichopogon* by the absence of striking pubescence on 8th sternite, which is only framed by sparse fine hairs.

Distribution: Afrotropical: Sudan, Ethiopia. Palaearctic: Egypt. New to the UAE.

Genus *Turkmenomyia* Paramonov, 1930 **revised status**

The genus *Turkmenomyia* comprises several minute species with characteristic red-yellow body colouration, including antennae and legs, absence of pulvilli and cell m3 with connecting vein at both ends. In the past, its systematic position was changed several times, finally being synonymised with the genus *Eremodromus* Zimin, 1928 (Lehr, 1979).

A brief history of the systematics of the genus *Turkmenomyia* is as follows. Zimin (1928) described the genus *Eremodromus* on the basis of material from Uzbekistan. Paramonov (1930) described the genus *Turkmenomyia* on the basis of material from Central Asia (*T. nigrita* and *T. gracilis*). Efflatoun (1937) described the species *Stichopogon flaviventris* Efflatoun, 1937, from Egypt, including outstanding colour illustrations. Hull (1962) treated *Eremodromus* and *Turkmenomyia* as separate genera. Lehr (1964) described *T. malkovskii* from Kazakhstan and included remarks on the distribution of all three so far known species (*T. nigrita*, *T. gracilis*, *T. malkovskii*). He also prepared a key to the tribe *Stichopogonini* in which the genus *Turkmenomyia* is explicitly distinguished from all other genera. In Lehr's papers (1975a, 1975b) on the genus *Stichopogon* in the territory of the former Soviet Union, he included *T. malkovskii* and *T. nigrita* in the genus *Stichopogon*. He did not mention *T. gracilis*. Lehr (1979) synonymised the genus *Turkmenomyia* with the genus *Eremodromus*. At the same time he included *S. flaviventris* Efflatoun, 1937, and *T. gracilis* Paramonov, 1930, in the genus *Eremodromus*. Theodor (1980) established the genus *Parastichopogon* for *S. flaviventris* Efflatoun, 1937, because it significantly differs from other species of the genus *Stichopogon*. He probably overlooked the paper by Lehr (1979). Lehr (1988), within the framework of the catalogue of the Palaearctic Diptera, listed the genera *Turkmenomyia* Paramonov, 1930, and *Parastichopogon* Theodor, 1980, as synonyms of the genus *Eremodromus* Zimin, 1928, and divided the above discussed species between the genera *Eremodromus* Zimin, 1928 (*flaviventris* Efflatoun, 1937, and *gracilis* Paramonov, 1930) and *Stichopogon* Loew, 1847 (*malkovskii* Lehr, 1964 and *nigrita* Paramonov, 1930).

On the basis of the material deposited in the authors' collections, we think it is necessary to consider *Turkmenomyia* as a valid genus. Both species originally described by Paramonov (1930), *T. gracilis* and *T. nigrita*, belong to this genus (**revised status**). When considering the description and illustration published by Efflatoun (1937), and subsequently by Theodor (1980), and the material deposited in the collection of Hradský, we think it is also necessary to include *Eremonotus flaviventris* (Efflatoun, 1937) in the genus *Turkmenomyia* (*T. flaviventris* **nov. comb.**). A further species of the genus is described below.

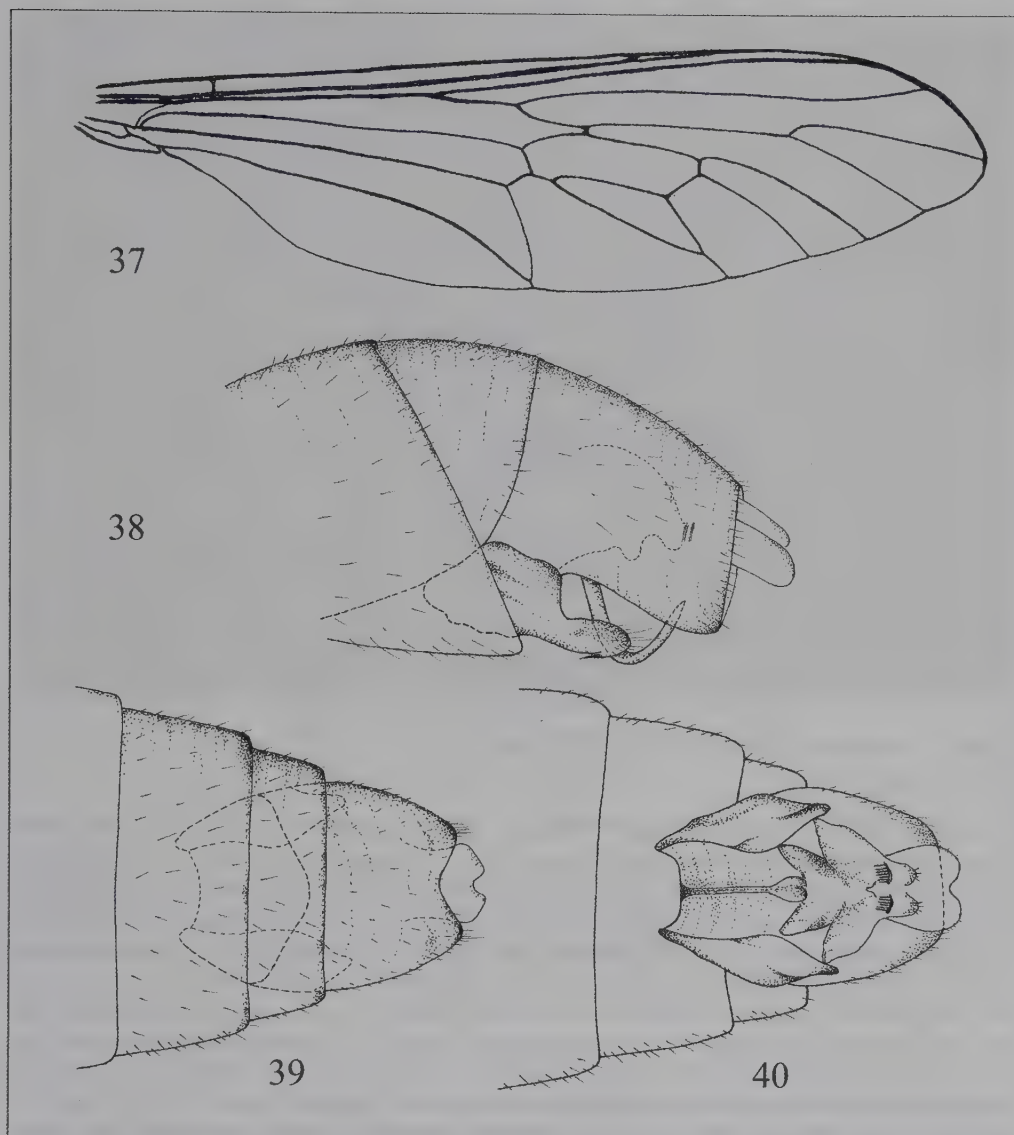
Turkmenomyia paramonovi Bosák & Hradský **nov. spec.**

Plates 59–60, Figures 37–40

Specimens examined: Holotype: ♂, United Arab Emirates, ar-Rafah [25°43'N 55°51'E], 29.iii.2008, hand-collected, leg. J. Bosák. Paratypes: 4♂, 7♀, same data as holotype; 5♂, 7♀, same locality but



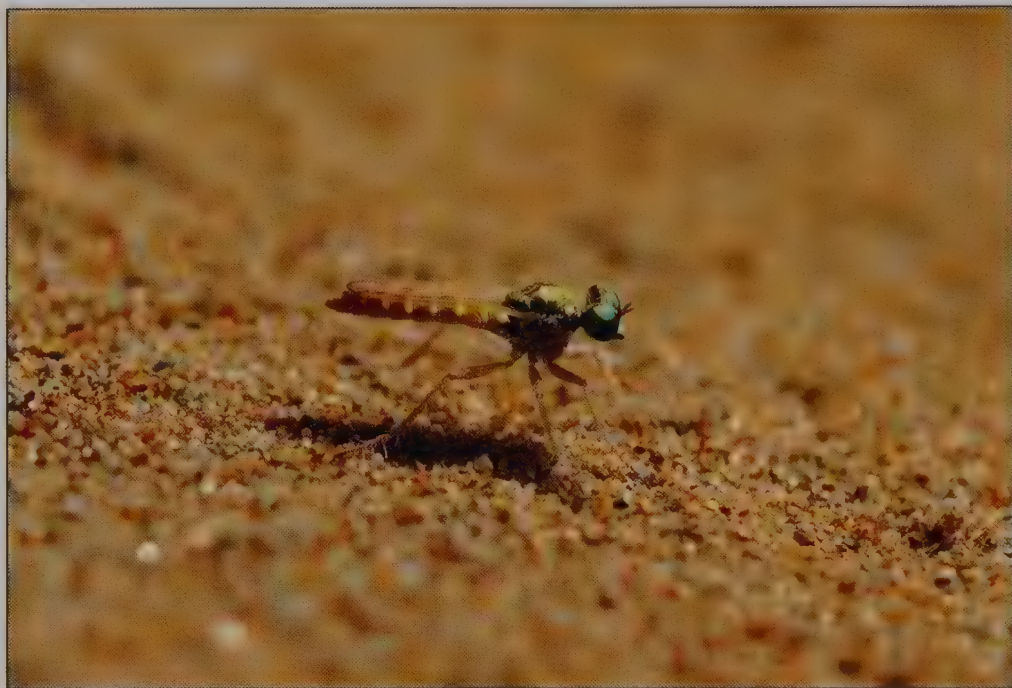
Plates 58–59. 58: *Stichopogon inconstans* (Wiedemann), female; 59: *Turkmenomyia paramonovi* Bosák & Hradský nov. spec., male, dorsal view.



Figures 37–40. *Turkmenomyia paramonovi* Bosák & Hradský nov. spec. 37: Wing; 38: Male terminalia, lateral view; 39: Epandrium and proctiger, dorsal view; 40: Idem, ventral view.

6.iv.2008, HC, leg. J. Bosák. 2♂, 5♀, near Hamraniyah, 2–7.iv.2009, HC, leg. J. Bosák. 1♂, Sharjah Desert Park, 9.viii–4.xi.2008, LT, AvH.

Description: Male. Head. Frons and face with grey-silver tomentum, mystax white-yellow, divided into several parts that are not fused. Postocular setae white, occiput with light grey tomentum, proboscis and palpi black. Palpi with white hairs. Mystax separated from base of antennae by length of pedicel. Scape black, round, pedicel basal segment red, twice as long as scape with numerous white hairs, postpedicel red, as long as the scape and pedicel together, ventrally with numerous hairs visible only when examined under strong magnification.



Plates 60. *Turkmenomyia paramonovi* Bosák & Hradský nov. spec..

Thorax olive-grey, dusted, only paramedian stripe of scutum distinct. One light yellow dorsocentral seta, 1 long notopleural, 1 supraalar and 2 postalar bristles, all yellow-white. Scutum with delicate short white hairs, scutellum marginally with a row of yellow-white fine hairs. Pleurae silvery-grey dusted, anepisternum without pubescence. Katatergal setae yellow-white, halteres yellow, with large knob on thin stem. Wings clear, light, veins red-yellow. Cell m3 with connecting vein on both ends. Legs red, with white hairs only. Abdomen honey-red, without striking ornamentation, tergites from middle towards apex with darker grey dusting. Margins of all tergites silverly-grey dusted with fine whitish hairs. Sternites light-grey dusted. Hypopygium grey dusted. Female as male. 8th sternite red-brown with light, white hairs. Acanthophorite spurs red between white hairs. Size: 4–7 mm

Remarks: *T. paramonovi* nov. spec. has a visible darker longitudinal stripe along the whole length of the abdomen. The abdomen is strikingly 'orange', the entire surface of femora 3 of the same colour as the abdomen. The abdomen of *T. gracilis* Paramonov, 1930, is dark, grey-orange with a faint or almost missing longitudinal stripe, femora 3 are yellow-orange. *T. nigrutta* Paramonov, 1930, has dark femora 3, brown-black except for pale yellow-orange tips. All specimens from our collections have rather damaged abdomens. *T. flaviventris* Efflatoun, 1937, has a grey-orange abdomen, dark femora 3. From the described species *T. paramonovi* nov. spec. also varies by the anatomy of the male terminalia (see Theodor, 1980).

The species was rather abundant in sandy sites covered with low, bushy vegetation. Adults occurred individually in close vicinity of the bushes. *Rhadinus vanharteni* nov. spec. was collected together with this species.

Distribution: UAE.

Etymology: The species is named after S.J. Paramonov, the author of the genus *Turkmenomyia*.

DISCUSSION

During the last few years a large amount of material of the family Asilidae has been collected within the framework of the UAE Insect Project. While until 2006 the occurrence of only 3 genera and 3 species belonging to this family was known from UAE, we have now recognized as many as 19 genera and 35 species, one genus and 12 species of which are described as new to science.

The characteristic feature of the asilid fauna of UAE is a mixture of components originating from Palaearctic and Afrotropical regions. From the 19 genera found in the area 5 are distributed worldwide, 5 occur only within the Palaearctic region, 4 genera penetrated through the Arabian Peninsula to the Afrotropical region from the Palaearctic region, and 5 genera spread from the Afrotropical region northwards to the Palaearctic region (Table 1). However, some genera, considered below as exclusively Palaearctic, will probably be discovered in the future at suitable sites of the southernmost part of the Arabian Peninsula and will, therefore, also enrich the Afrotropical fauna of Asilidae.

Table 1. Correlation of individual genera to zoogeographic regions.

Exclusively Palaearctic	Palaearctic, penetrating into the Afrotropical region	Afrotropical, penetrating into the Palaearctic region	Widespread
<i>Amphisbetetus</i>	<i>Apoclea</i>	<i>Lamyra</i>	<i>Leptogaster</i>
<i>Eremisca</i>	<i>Ctenota</i>	<i>Neolophonotus</i>	<i>Ommatius</i>
<i>Dichropogon</i>	<i>Habropogon</i>	<i>Stiphrolamyra</i>	<i>Promachus</i>
<i>Turkmenomyia</i>	<i>Rhadinus</i>	<i>Sisyronodites</i>	<i>Saropogon</i>
<i>Wadipogon</i>		<i>Trichardis</i>	<i>Stichopogon</i>

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Authors'addresses:

Dr. Jaroslav Bosák, Ecological Consulting a.s., Na Střelnici 48, CZ-779 00 Olomouc-Lazce, Czech Republic; e-mail: jaroslav.bosak@ecological.cz

M. Hradský, Mlékovice 40, CZ-281 44 Zámuky, Czech Republic.

Order Diptera, family Empididae

A new species of *Hilara* Meigen, 1822

Milan Chvála and Andreas Stark

INTRODUCTION

Until now only one specimen of the family Empididae was identified in the UAE within the whole sampling campaign (Plant, 2009), which yielded hundreds of thousands of insects over the recent years. It is no surprise that the diversity of this family is so poor, because we consider many species as being reliant upon humid climatic conditions and/or aquatic habitats. Because of its desolation large parts of the UAE seem to be uninhabitable for empids, but suitable habitats exist, even if scattered and often isolated, and may be considered as hot spots of the whole range of arthropod biodiversity. Surprisingly a second, hitherto undescribed empid species of the species rich genus *Hilara* Meigen, 1822, was collected by the means of light traps in the Hatta environs and in Wadi Madaq. It is a great honour for us, to describe this species within the scope of the faunistic inventory of the UAE.

SYSTEMATIC ACCOUNT

Subfamily **Empidinae** Hennig, 1973

Tribe **Hilarini** Collin, 1961

***Hilara tarsicalcarata* Chvála & Stark nov. spec.**

Plates 1–9

Specimens examined: Holotype: ♂, United Arab Emirates, Hatta, 30.i-26.ii.2006, light trap, leg. A. van Harten, glued on tip of triangular card and pinned [original, handwritten label as follows: “UAE: | Hatta | 30.I-26.II.2006 | light trap | A. van Harten”]; second printed label as follows: “NMW IMAGED 2009 JAT | BioSiD i 14392” (lines are delimited by a “|”-sign), third printed red label “Holotype”]. Deposited at the National Museum of Wales, Cardiff, UK. Paratypes [2♂, 2♀]: United Arab Emirates, Hatta, 30.i-26.ii.2006, 1♂ (glued on card and pinned, abdomen macerated in lactic acid, transferred to glycerol and attached in a microvial to the pin); 1♀ (glued on card and pinned, second label: “NMW Imaged: 2009 JAT, BioSiD i14393”), light trap, leg. A. van Harten, both these specimens deposited at the National Museum of Wales, Cardiff, UK. 1♂, same data but 19–28.iii.2006 and 1♀ from Wadi Madaq, 2–16.ii.2006, light trap, leg. A. van Harten (both these specimens stored in 80% ethanol, in coll. A. Stark, Halle, Germany). All specimens labelled as “Paratype”.

Abbreviations used in the description: bt = basitarsus, t = tibia; f = femur (numbers 1–3 indicate the front leg = 1, mid leg = 2, hind leg = 3); acr = acrostichal bristles; dc = dorsocentral bristles.

Diagnosis: A small, body about 3–4 (5) mm long, rather dark grey dusted species, with yellow haltere and whitish abdominal pubescence. Antennae and legs blackish, frons and occiput dull grey, wings almost clear in both sexes. Male *bt*1 largely swollen, and like *t*1 dorsally fairly long black bristled, following 2 tarsomeres dorsally at tip curiously produced; female *t*3 slender and slightly curved, and last abdominal segments forming a telescopic slender ovipositor.

Description: Male. Length of the ethanol-preserved specimen 3.8 mm (Plate 1); the dried specimens are considerably shrunken, length of the holotype male 2.6 mm, wing 3.2 mm long and 0.9 mm broad.



Plates 1–6. *Hilara tarsicalcarata* Chvála & Stark nov. spec., male; 1: Habitus (moist stored specimen superficially dried); 2: Head (moist); 3: Thorax (moist); 4: Tip of tibia and tarsus of left front leg, arrows indicate the *calcarae* on 2nd and 3rd tarsal segments; 5: Hypopygium viewed from above; 6: Right lateral lamella. (Photographs by A. Stark)

Head dull grey (Plate 2), uniformly dark grey dusted on frons, face and occiput; face parallel-sided and almost equally wide as frons, which is only indistinctly widening above. A pair of black ocellar and frontal setae unusually long and stout, both nearly as long as antennal segment 3 with style. Occipital hairs blackish above, small and fine, lower hairs below neck longer and whitish. Antennae uniformly black, apical style slender and fairly long, two-thirds length of segment 3, followed by a short and thin stylus (Plate 2). Palpi dull grey, ventrally clothed with numerous short fine dark hairs, and usually with 3 very long black ventral setae, the longest preapical seta as long as labrum. Proboscis fairly long, labrum when extended nearly as long as head is high.

Thorax dulled by greyish dusting, densely golden-brownish dusted on scutum, pleura smoothly silvery-greyish dusted. Scutum when viewed from in front with two wide dark faint greyish-black to greyish-brown stripes between *acr* and *dc*, in dorsal and posterior views the two stripes become narrower and disappear before prescutellar depression, and there are a further two similar longer stripes outside the *dc* setae (Plate 3). Large marginal bristles fine, rather short and thin, black: 1 humeral (postpronotal), usually 3 notopleural, 1 postalar, 2 pairs of longer strong prescutellar *dc*, and 2 pairs of similarly long scutellars, the inner pair the longer; the fine setae on scutum, especially in the notopleural depression, with a tendency to be pale; *acr* widely 4-serial, but distinctly separated from 1-serial *dc*, all numerous (more than 10 setae in one row), small and inconspicuous, black, although clearly paler in some lights. Prothorax clothed with sparse minute pale hairs.

Wings 3.4×1.1 mm (maximum length \times maximum width among the material examined), clear with distinct dark veins, stigma indistinct, light brownish, radial fork long and rather narrow, and anal vein visible at base only. A long black costal bristle, squama with long whitish fringes. Haltere yellow.

Legs rather short and slender, black in ground colour, uniformly finely greyish pollinose, only coxae more densely and lighter grey dusted, and all "knees" narrowly paler, light brownish. All femora unmodified, slender, and covered mostly with sparse minute dark hairs, none of the long setae longer than femora are deep: *f1* with densely set longer dark setae posteriorly and posteroventrally, *f2* with only a single row of the usual black anterior setae, and *f3* with only several longer black anteroventral setae on apical half, but even these scarcely as long as femur is deep; *t1* (Plate 1) rather short, very slightly dilated towards tip, dorsally with a row of distinct black setae, those on apical half becoming longer towards tip and much longer than tibia is deep; *bt1* large and very stout, evenly ovate, only slightly shorter than corresponding tibia (ratio 4:5), and dorsally with similar but slightly shorter black bristling; rest of tarsus slightly shorter than basitarsus (ratio 3:4), slender and covered with minute hairs only, but tarsomeres 2 and 3 (Plate 4) dorsally at tip with curious cup-like projections (*calcarae*). Posterior four tibiae and tarsi unmodified, all very long and slender, without distinct setae, covered with only minute hairs, and the long slender tarsi on both pairs only very slightly shorter than corresponding tibiae.

Abdomen black to blackish-brown in ground colour, uniformly finely greyish pollinose, scarcely subshining; pubescence uniformly whitish, fine though distinct, but hind-marginal bristles not developed. Genitalia (Plates 5, 6) concolorous with abdomen, similarly finely pollinose like abdomen, and covered with minute whitish hairs; hypandrium produced posteriorly, and lateral lamella with a long, slender, apically pointed apical projection.

Female. Length of the ethanol-preserved specimen (including the extended ovipositor) 5 mm (Plate 7); the dried female specimen is considerably shrunken, its length is only 3 mm.



Plates 7–9. *Hilara tarsicalcarata* Chvála & Stark nov. spec., female; 7: Habitus (moist, therefore rather dark); 8: Left hind tibia viewed from behind, arrows indicate beginning and end of an area covered with short, white, stiff hairs; 9: Abdominal segments 6–9 in lateral view, arrow indicates the laterally glossy and heavily sclerotised 8th sternite. (Photographs by A. Stark)

Head, thorax and wings as in male, only wings perhaps with a tendency to be slightly brownish in some lights and a little broader than in male (3.4×1.3 mm in the moist preserved specimen).

Even legs very much as in male, similarly slender and unmodified, compared with male without the sexual structures on fore leg, and all parts devoid of distinct setae, everywhere only fine short hairing. Fore tarsus slender and unmodified, all tibiae slender, even t_3 slender, although slightly curved when seen from behind (Plate 8), and the pubescence on tibiae and tarsi minute as in males. Tibia on its inner side, just where it is curved, covered with erect stiff hairs (Plate 8). The colouration and pubescence of abdomen as in male, the whitish short pubescence more inconspicuous, but a structure of abdominal segments is very unusual: basal five segments stout as in male, but the following 4 abdominal segments (segments 6–9) evenly and very unusually narrowed, densely grey dusted, thus duller and more greyish, forming a long telescopic ovipositor-like apical half of abdomen. These segments are separated from the basal abdominal segments by a remarkable broad integument, which

enables this apical part a multi-directional flexibility. The 8th sternite laterally glossy and heavily sclerotized (Plate 9).

Differential diagnosis: This new Palaearctic *Hilara* species of the Near East undoubtedly belongs to the *Hilara litorea* group of species sensu Chvála (2005: 89). The species of this group are characterized by their generally small size, the densely greyish dusted and only finely bristled body, by the slender legs with long tibiae and tarsi devoid of strong setae, female hind tibiae always slender and at most only slightly bent at middle, and scutum is clothed with numerous small fine *acr* and *dc* setae.

Within the Mediterranean *Hilara* species (Chvála, 2008), *H. tarsicalcarata* nov. spec. resembles in many respects the Spanish *H. neolitorea* Chvála, 2008, and the Asian Turkish *H. antalyensis* Chvála, 2008, of the *H. litorea*-group of species; the former is a slightly larger (body 3–3.5 mm long) and lighter grey dusted species with yellow palpi, *br1* in male is small and only slightly dilated, dorsally covered with short hairs only, and female *t3* is quite simple; the Turkish *Hilara antalyensis* is similarly smaller (body 2.6–3.3 mm long), but besides the yellow palpi also the legs are extensively yellow. A further two species of the *H. litorea*-group, *Hilara platyura* Loew, 1873, and *Hilara spiniplatyura* Chvála, 2008, are both a larger-sized species with body more than 3 mm long, characteristic by the light grey head and unstriped scutum, but abdomen is contrastingly subshining blackish compared with the grey thorax.

Within the *Hilara* species known up to now from the Near East, that might accidentally be confused with this new species of the UAE., a further two species should be mentioned: (1) *Hilara bernmerzi* Chvála, 2008, a species of the *Hilara cornicula*-group, known also from the Asiatic part of Turkey, is a similar small dark greyish dusted species, but frons and occiput are dull black, abdominal pubescence is black, and the setae of the 2 inner rows of the 4-serial *acr* are unusually diverging. (2) *Hilara kervillei* Collin, 1937, a species of the *Hilara lasiochira*-group, was described from Syria, and is a widely distributed species in the Eastern Mediterranean including the Near East; it is of the same size as *H. tarsicalcarata* nov. spec., but occiput, haltere and abdominal pubescence are black, *acr* are 2-serial, abdomen is clothed with dense long pubescence including long hind-marginal bristles, and also legs are densely long black pubescent and bristled, the tibiae in particular.

Four further *Hilara* species are known from the Near East, which may also occur in the UAE, *Hilara cuneata* Loew, 1873, *H. cypriana* Chvála, 2008, *H. megalochira* Collin, 1937, and *H. spectabilis* Chvála, 2008, are all much larger sized species and, except for *H. megalochira*, with yellow legs.

However, in the differential key to the Alpine, and in general European mountain species (Chvála & Merz, 2009: 524), *H. tarsicalcarata* surprisingly runs to a very similar and closely allied exclusively Alpine *Hilara leukensis* Chvála & Merz, 2009, of the *H. platyura* complex of the *H. litorea*-group, known so far only at the lower altitudes of the Swiss Alps. *Hilara leukensis* differs from *H. tarsicalcarata* chiefly by the short pubescent fore leg in male, and quite simple, unmodified hind tibia and abdomen in female.

Distribution. United Arab Emirates (Hatta, Wadi Madaq).

Derivatio nominis: “*tarsi-calcarata*” – indicating the unusual curious apical projections (*calcarae*) on the 2nd and 3rd tarsomeres of the male fore tarsus.

DISCUSSION

The existence of a long telescopic and highly moveable ovipositor in *H. tarsicalcarata* is a remarkable feature in this genus. As one might assume it might serve to deposit eggs in narrower crevices or slits to avoid their dehydration in this special climatic conditions. This

character might be present in other *Hilara* species which are inhabitants of arid areas as well, but was hitherto probably overlooked due to the fact that mostly pinned specimens have been examined.

ACKNOWLEDGEMENTS

We are much indebted to Mr. Antonius van Harten (Sharjah) for the possibility to study this valuable material from the United Arab Emirates. We appreciate very much, that these tiny flies have been traced as being something special among the huge amount of insects within the material collected by light traps and wish to thank Mr. Antonius van Harten and Dr. John Deeming (Cardiff) for this skillful work.

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Authors' addresses:

Dr. Milan Chvála, Department of Zoology, Charles University Prague, Viničná 7, CZ-128 44 Praha 2, Czech Republic; e-mail: mchvala@natur.cuni.cz

Dr. Andreas Stark, Seebener Str. 190, 06114 Halle (Saale), Germany (free co-worker at Senckenberg Deutsches Entomologisches Institut, Eberswalder Strasse 90, 15374 Müncheberg, Germany); e-mail: stark@ampyx-verlag.de

Order Diptera, family Diopsidae

Martin Hauser, John C. Deeming, Jens-Hermann Stuke

INTRODUCTION

The family Diopsidae, or stalk-eyed flies, is a comparatively small acalyptrate family of flies containing nearly 200 species in 11 to 14 genera dependant upon the opinions of authors. The greatest diversity is in the Old World, in the tropical and subtropical parts of Africa followed by SE Asia, with a few species in the Palaearctic region and two species in temperate eastern North America. The family is absent from South America, Australia and Antarctic. Most members of this family are characterized by the presence of eye stalks in both sexes. Other dipteran families (Drosophilidae, Micropezidae, Periscelididae, Platystomatidae, Richardidae, Tephritidae, and Ulidiidae) have a few exceptional species with eye stalks, mainly in the male sex (Grimaldi & Fenster, 1989). Only the Diopsidae have the antennae next to the eyes, while in all other families, the antennae are in the middle of the head and not on the stalk. The only Diopsidae without eye stalks are the African genera *Centrioncus* Speiser, 1910, and *Teloglabus* Feijen, 1983 (which are sometimes placed in their own family Centrioncidae) (Feijen, 1983). The subfamily Centrioncinae is the sister to all other Diopsidae. In the subfamily Diopsinae, the genus *Sphyracephala* Say, 1828, characterized by their short and broad eye stalks, belongs into the Sphyracephalini, which is the sister to the Diopsini (Kotrba et al., 2010). The genus *Sphyracephala* has the widest distribution, being found all over Africa, South-eastern Europe (Papp et al., 1997), the Caucasus (Armenia), southern Asia, eastern Palaearctic (Far East Russia), Japan and eastern North America. Hennig (1941) provided a key to the Palaearctic species of *Sphyracephala* and illustrated the male genitalia. Since then only one new species has been described from Hungary (Papp et al., 1997). Little is known about the larval biology of this family, but most known larvae are saprophagous and are found in decaying plant material; only a few species are phytophagous stem borers and can be pests in rice (Deeming, 1982; Feijen, 1983; Khan et al., 1991). The most comprehensive work about this family is by Feijen (1989). Hilger (2000) gives an excellent summary for the Palaearctic Region.

MATERIALS AND METHODS

The specimens will be divided between the United Arab Emirates Invertebrate Collection, the California State Collection of Arthropods, Sacramento, California, USA and the National Museum of Wales, Cardiff, England.

SYSTEMATIC ACCOUNT

Sphyracephala beccarii (Rondani, 1873)

Plates 1–3

Specimens examined: Wadi Hayl [25°04.83'N 56°13.53'E, 240 m], 12♂, 13♀, 15.iii.2008, leg. M. Hauser; 9♂, 13♀, same data but leg. J.-H. Stuke. Wadi W Mirba, mountain oasis [25°16,22'N, 056°16,68'E], 1♀, 13.iii.2008, leg. J.-H. Stuke. Wadi Shawkah, 1♂, 20–26.iii.2007, water trap, leg. F. Menzel.

Remarks: In Wadi Hayl, the flies aggregated on a rock overhang above a small water pond. There were numerous specimens walking around in the shade and several could be found in copula (Plates 2–3). The same behaviour was reported by Feijen (1989) for *S. beccarii*, by Sen (1912) from India while observing *Sphyracephala hearseiana* (Westwood, 1845) and by



Plate 1. Female specimen of *Sphyracephala beccarii* (Rondani) at Wadi Hayl.

Ôhara (1993) from Japan while observing *Sphyracephala detrahens* (Walker, 1860). The location near Mirba was a stone wall in the shade, over which water from an irrigation channel was trickling.

Additional material: We want to give here the detailed collecting information about the material mentioned only as country records by Dawah & Abdullah (2008); all specimens are in the collection of the National Museum of Wales, Cardiff, England.

OMAN: Ain Razat, on *Calotropis*, 1♂, 2♀, 13.ii.1989, leg. M.J. Ebejer. Dhofar, Ain Sahwoot, 2♀, 9.xi.1992, leg. J.C. Deeming. Dhofar, Ain Jarziz, spring in cave, 2♂, 2♀, 11.xi.1992, leg. J.C. Deeming. Dhofar, Ain Hamran, 1♂, 1.xi.1988, leg. M.J. Ebejer. Dhofar, Hajayf (*Euphorbia* vegetational zone), 1♂, 12.x.1990, leg. J.C. Deeming. YEMEN: Al-Lahima, 1♀, 16.x–31.xii.2000, Malaise trap, leg. A. van Harten & A.M. Hager. Suq Bani Mansour, 1♀, 28.viii–26.ix.2001, Malaise trap, leg. A. van Harten. Ar- Rujum, 1♀, 16.x.2000, Malaise trap, leg. A. van Harten & A.M. Hager. 12 km NW of Manakhah, 1♂, 1♀, 3.vii–21.viii.2001, leg. A. van Harten; 1♂, 5.v–17.vi.2002, Malaise trap, leg. A. van Harten. KENYA: Rift Valley, Ol Arabe Gorge, 5♂, 5♀, xi.1988, leg. R.K. Butlin. NIGERIA: Bauchi State, River Bagel at crossing of Bauchi-Dass road, roosting in moist cave in bank of dry river, 4♀, 3.iv.1990, leg. J.C. Deeming. Sokoto, 2♂, 1♀, 2.i.1983, leg. A. Hamid. NIGER: Air Massif, Wadi Iberkom, natural spring, 1♀, 24.viii.1983, leg. P.C. Matteson. MALI: Mourdiah, 3♀, viii.1986, leg. M. Matthews. **Distribution:** Algeria (Bezzi, 1922; Hennig, 1941; Vaillant, 1953), Saudi Arabia (Dawah & Abdullah, 2008), Yemen, Oman, Eritrea, Ethiopia, Kenya, Tanzania, Madagascar, Nigeria, Niger, and Mali (Feijen, 1989). New to the UAE.

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Plates 2-3. *Sphyracephala beccarii*, mating pairs, sitting on a rock surface above water.

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Author's addresses:

Dr. M. Hauser, California Department of Food and Agriculture, Plant Pest Diagnostics Branch, 3294 Meadowview Road, Sacramento, CA 95832, USA; e-mail: phycus@gmail.com
 Dr. J.C. Deeming, Research Fellow, Entomology Section, National Museum of Wales, Cathays Park, Cardiff CF10 3NP, UK; e-mail: John.Deeming@museumwales.ac.uk
 Dr. J.-H. Stuke, Roter Weg 22, 26789 Leer, Germany; e-mail: jhstuke@zfz.uni-bremen.de

Order Diptera, family Tephritidae

Additions and the description of a new species

Bernhard Merz

INTRODUCTION

In a first contribution of the fauna of the family Tephritidae (true fruit flies) of the United Arab Emirates the available literature was reviewed and 628 specimens were identified (Merz, 2008). They were mainly collected by A. van Harten with various traps in the years 2004, 2005 and 2006. As a result of this study a checklist of 27 species was presented with two species described new to science. It was shown that due to the efforts of A. van Harten 18 species could be added to the 9 species mentioned in the literature. In the discussion it was already concluded that compared to neighbouring countries further species could be expected. Since the publication of this study (Merz, 2008) numerous further specimens of Tephritidae were collected and sent to the author. Their identifications are presented in this supplement. Data about the distribution and references for those species already recorded in the first contribution are not repeated here.

This supplement is based on the identification of 607 further specimens of Tephritidae. They were mainly collected with various traps by A. van Harten. A few specimens caught with a sweeping net by other entomologists are also included. Four known species are recorded for the first time from the UAE and one species new to science is described.

In addition to the new species described in this contribution, further species representing new species to science were examined, especially in the genus *Goniurellia*. However, because of the taxonomic difficulties in this genus and because only single specimens were available they are not described formally. More specimens are needed in order to know variability and morphology of both sexes of these taxa.

MATERIALS AND METHODS

The references concerning nomenclature, arrangement of the species, morphological terminology and general remarks are the same as in Merz (2008) and are not listed again.

Most specimens are deposited in the entomological collection of the MHNG (= Muséum d'histoire naturelle Genève) except for almost all specimens collected by Jens-Hermann Stuke which are kept in his private collection (exceptions indicated below). Some duplicate specimens are returned to the United Arab Emirates Invertebrate Collection.

The following abbreviations are used in the systematic part: LT = light trap; MT = Malaise trap; WT = water trap; AvH = leg. Antonius van Harten; JHS = leg. Jens-Hermann Stuke.

SYSTEMATIC ACCOUNT

Subfamily **Trypetinae** Loew, 1861

Bactrocera (Zeugodacus) cucurbitae (Coquillett, 1899)

Specimens examined: Sharjah Desert Park, 1 ex., 1–30.iv.2008, LT, AvH.

Recognition: White (2006).

Plate 1

Remarks: This is a major pest species of Cucurbitaceae, for instance melon, pumpkin, cucumber or watermelon. These fruits are often heavily attacked and larvae of *B. cucurbitae* may destroy entire plantations with cultivated Cucurbitaceae (White & Elson-Harris, 1992).

Distribution: From tropical Asia; by human activities now distributed everywhere in the Old World Tropics from New Guinea, Indonesia, Japan throughout China over Pakistan to many Afrotropical countries. It was described from specimens collected on the islands of Hawaii, where it is still abundant (Foote et al., 1993). *B. cucurbitae* was recorded from "Arabia" by White (2006, locality "Abu", not further specified) and from Saudi Arabia based on literature only by Merz & Dawah (2005). New record for the UAE.

***Bactrocera (Bactrocera) zonata* (Saunders, 1842)**

Specimens examined: Bithna, 11 ex., 16.ii.2009, Farmer's insect trap, leg. M. Jaschhof. Fujairah, 1 ex., 1–8.iv.2006, LT, AvH. Near Mahafiz, 1 ex., 21–28.viii.2006, LT, AvH. Wadi Bih, 1 ex., 29.iii.2007, sweep-net, leg. F. Menzel. Wadi Bih Dam, 4 ex., 19–25.ii.2009, MT, AvH. Wadi Madaq, 1 ex., 20.ii–2.iii.2009, WT, AvH. Wadi Safad, 1 ex., 15–22.iv.2006, LT, AvH. Wadi Wurayah farm, 1 ex., 24–30.iii.2009, MT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Carpomya incompleta* (Becker, 1903)**

Specimens examined: Wadi Bih Dam, 1 ex., 6–17.iii.2008, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Carpomya vesuviana* Costa, 1854**

Specimens examined: Ra's al-Khaimah, farm, 1 ex., 16.iii.2008, JHS. Sharjah Desert Park, 7 ex., 30.iv–25.v.2008, LT, AvH. Wadi Bih Dam, 1 ex., 19–25.ii.2009, MT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Dacus (Didacus) ciliatus* Loew, 1862**

Specimens examined: Near Mahafiz, 1 ex., 19–26.iv.2006, LT, AvH. Sharjah Desert Park, 1 ex., 1–8.iv.2007, LT, AvH. Wadi Hayl, 1 ex., 28.iii.2007, sweep-net, leg. F. Menzel & A. Stark. Wadi Safad, 2 ex., 15–22.iv.2006, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Dacus (Leptoxyda) persicus* Hendel, 1927**

Specimens examined: Sharjah Desert Park, 3 ex., 24.xi–22.xii.2007, 30.iv–25.v.2008, LT, AvH. Wadi Shawkah, 1 ex., 5–12.v.2007, WT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Dacus (Didacus) semisphaereus* Becker, 1903**

Specimens examined: Sharjah Desert Park, 154 ex., 17–24.iii.2007, 15–22.iv.2007, 23–30.iv.2007, 5–12.v.2007, 12–21.v.2007, 21–28.v.2007, 28.v–4.vi.2007, 4–9.vi.2007, 1–30.iv.2008, 30.iv–25.v.2008, LT, AvH. Wadi Shawkah, 1 ex., 19–22.v.2007, WT, AvH. Wadi Wurayah, 1 ex., 11–18.iii.2008, MT, AvH. Wadi Wurayah farm, 1 ex., 24–30.iii.2009, MT, AvH.

See Merz (2008) for details of its recognition and distribution.

Subfamily Tephritinae Newman, 1834

***Acanthiophilus helianthi* (Rossi, 1794)**

Specimens examined: Khor al-Khwait, 1 ex., 15–22.iii.2007, LT, AvH. Sharjah Desert Park, 3 ex., 17–24.iii.2007, 21.xii.2007–23.i.2008, 14.ii–1.iv.2008, LT, AvH; 2 ex., 12.iii.2008, JHS. Wadi Madaq,

2 ex., 3–17.ii.2008, 20.ii–2.iii.2009, WT, AvH. Wadi Shawkah, 1 ex., 18.iii.2007, sweep-net, leg. F. Menzel & A. Stark. Wadi Wurayah farm, 1 ex., 15–30.iii.2009, LT, AvH.
See Merz (2008) for details of its recognition and distribution.

***Aciura afghana* (Hering, 1961)**

Specimens examined: Wadi Madaq, 1 ex., 20.i–3.ii.2008, WT, AvH.
See Merz (2008) for details of its recognition and distribution.

Euarestella korneyevi* Merz *nov. spec.

Plate 2, Figures 1–4

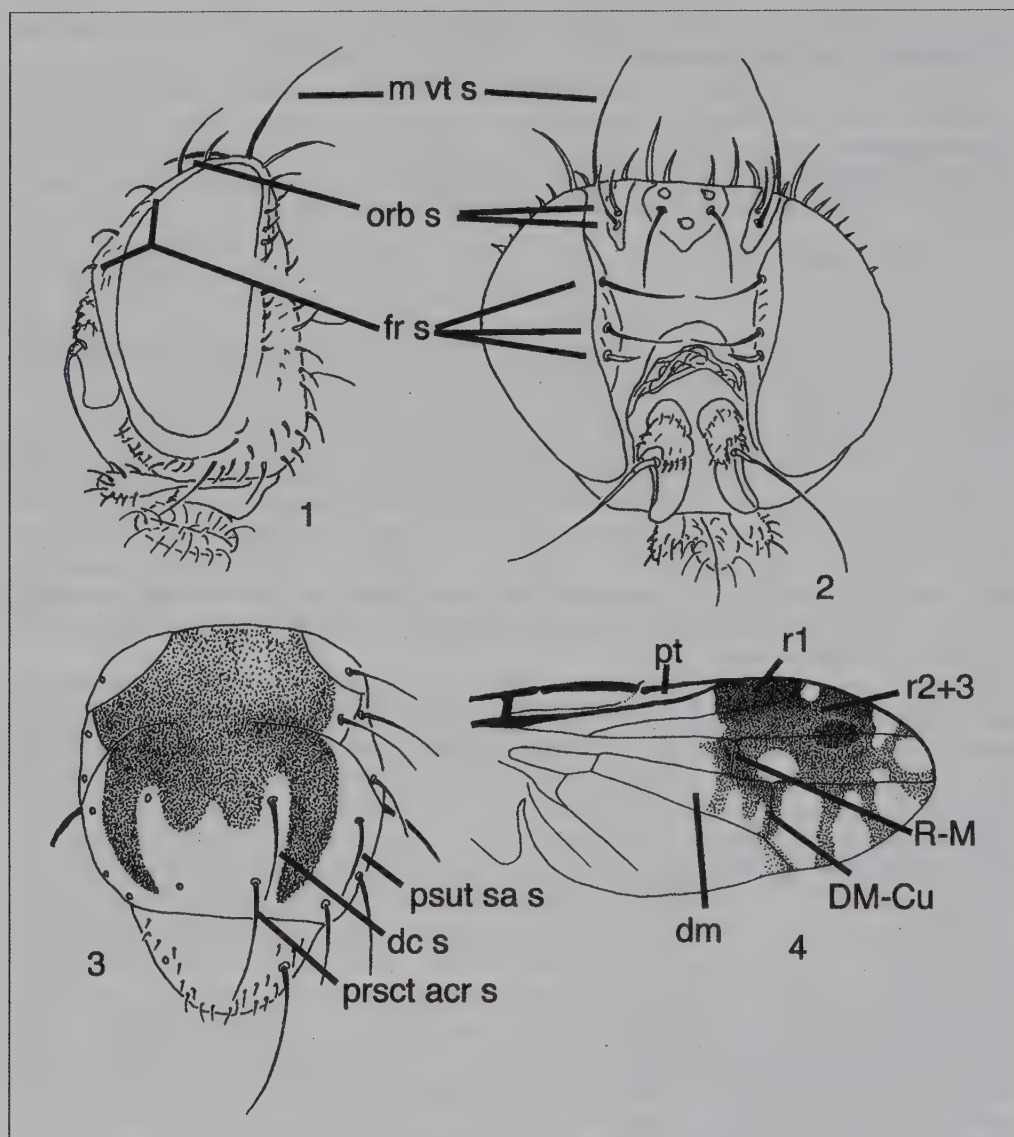
Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Wurayah farm, 25°23'N 56°19'E, 15–30.iii.2009, light trap, leg. A. van Harten (MHNG).

The holotype is in rather good condition with only a few setae broken or damaged. It was collected in alcohol, dried and pinned on a minuten pin on a block of plastozote.

Diagnosis: This species fits the concept of *Euarestella* as defined by Freidberg & Kugler (1989) and Merz (1999, 2008). It can be easily recognized by its 'narrow-stellate' wing pattern (Fig. 4) with a fully hyaline pterostigma and the entirely dark cell r1 distally R1. All other known species of the genus have the pterostigma entirely or partly black and their cell r1 contains at least one hyaline spot distally R1. The mesonotum is characterized by a lyre-like yellow brown and silvery grey pattern (Fig. 3) which is more conspicuous than in the other species of *Euarestella*. In particular, the yellow brown area between the prescutellar acrostichal setae and the scutellum is unique. In all other species of the genus this area is silvery grey microtrichose.

Description: Wing length 2.1 mm (n=1). Head as in Figures 1–2. Colouration: Yellow including antennae and mouthparts; fronto-orbital plates, ocellar triangle and a pair of spots laterally on occiput slightly silvery-grey microtrichose. Structure: In profile 1.6 times higher than long; gena 0.15 times as high as compound eye, about two thirds as high as width of postpedicel; compound eye about twice as high as long; occiput more or less flat; frons almost parallel-sided, about 1.6 times wider than compound eye and about 1.1 times wider than long (measured between posterior ocelli and lunule); frons bare, lunule a semicircle; face more or less flat, without carina, ventral margin slightly protruding. Antenna: Scape indistinct and small, barely visible in profile, white setulose; pedicel about 2.5 times longer than scape, brown setulose; postpedicel with short, white setulae, about 1.15 times longer than wide, dorsally more or less straight, apico-dorsally with an indistinct point; arista very short setulose, longest rays less than half as long as basal diameter of arista. Mouthparts: Palpus more or less parallel-sided, slightly projecting beyond anterior margin of vibrissal angle, apically with some outstanding, stiff, brown setulae; proboscis capitate. Chaetotaxy (all setae paired): 3 converging frontal setae, the anterior half as long as the two posterior, white, lanceolate; the two posterior brown, acuminate; 2 reclinate orbital setae, the anterior about as long as the posteriormost fronto-orbital setae, brown, acuminate; the posterior white, lanceolate and about two thirds as long as the anterior; ocellar seta brown, acuminate, tip on both sides broken; one slightly converging, brown, acuminate medial vertical seta about 1.5 times longer than longest frontal seta; other setae on occiput and along eye margin white, lanceolate and shorter; 1 slightly diverging lateral vertical seta; 1 upright medial postocellar seta; 1 upright postocellar seta; 1 converging, short paraverticlar seta; 1 row of uniformly white postocular setae; 1 brown, acuminate genal seta; other setae along vibrissal corner, gena, postgena and occiput white, lanceolate.

Thorax as in Figure 3. Colouration: Ground colour of scutum yellow brown but dorsum with silvery grey microtrichose, lyre-like pattern on black ground covering uniformly the area



Figures 1–4. *Euarestella korneyevi* nov. spec., male holotype. 1: Head, lateral view; 2: Head, dorsal view; 3: Thorax, dorsal view (setulae on mesonotum omitted); 4: Wing (all drawn in situ). Abbreviations: setae – dc s = dorsocentral seta; fr s = frontal setae; m vt s = medial vertical seta; orb s = orbital setae; prsct acr s = prescutellar acrostichal seta; psut sa s = postsutural supra-alar seta. Cells – dm = discoidal cell; pt = pterostigma; r1, r2+3. Veins – DM-Cu, R-M

anterior of suture, posteriorly with two pairs of teeth: the lateral pair between lines of dorsocentral and postsutural supra-alar seta extending to level of prescutellar acrostichal seta; the medial pair between dorsocentral setae ending slightly posterior of level of dorsocentral seta; postpronotal lobe, posterior half of notopleuron and prothoracic sclerites creamy yellow; meron ventrally of haltere with an almost undusted, conspicuous dark brown, ill-defined spot;

subscutellum and mediotergite thinly grey microtrichose on dark brown ground. Chaetotaxy (all setae paired): Setae pale brown, acuminate, posterior notopleural seta not much paler, only anepimeral seta clearly white, lanceolate; whole thorax covered with conspicuous, short, thick, lanceolate, white setulae, but scutellum on dorsum mostly bare; dorsocentral seta well posterior line of suture, between lines of posterior notopleural seta and postsutural supra-alar seta; 1 prescutellar acrostichal seta; 1 postpronotal seta; 2 notopleural setae (posterior notopleural seta about two thirds as long as anterior), 1 presutural supra-alar seta, 1 postsutural supra-alar seta; 1 intra-alar seta; 1 postalar seta; 1 (pair of) basal scutellar setae (apical scutellar seta absent); 1 anepisternal seta; 1 katepisternal seta; 1 anepimeral seta; prosternum densely white setulose. Legs: Yellow brown, including all tarsal segments; fore femur with a row of 3–4 pale brown posteroventral setae, all other setae and setulae white, lanceolate; hind femur without subapical dorsal seta. Wing (Fig. 4): Veins bare, only R1 setulose dorsally except for gap at level of tip of Sc; costal spine minute; C ending at M; wing tip between R4+5 and M; cell c2 about 1.5 times as long as pterostigma; distance between R-M and DM-Cu crossveins on M about as long as length of R-M and about one quarter as long as last section on M between DM-Cu and wing tip; pattern rather pale brown, of 'narrow-stellate' type as defined by Merz (1999) with 7 rays; base of wing up to level of tip of R1 fully hyaline including pterostigma; dark apical portion of cell r1 posterior tip of R1 uniformly dark, not interrupted by a hyaline spot; r2+3 with one hyaline spot at tip of R2+3 less than half width of cell; r4+5 with one hyaline spot dorsally of DM-Cu about half as wide as width of cell; R-M within the dark pattern; apex of wing with a short fork of two narrow, parallel-sided rays; m with two parallel-sided, narrow rays crossing the entire cell; one ray along DM-Cu until wing margin; two rays in dm between continuation of R-M and DM-Cu not reaching posterior margin of cell; bulla present but rather indistinct. Calypter and haltere creamy yellow.

Abdomen (only male): Ground colour mat yellow brown, thinly microtrichose, posterior margin of tergites, sternites and terminalia creamy yellow; all setae and setulae white; sternite 5 slightly concave posteriorly in middle, laterally with one pair of longer, slightly darker setae; epandrium elongate, prensisetae almost black; proctiger large; distiphallus partly exposed in holotype, coiled, long, bare; glans hidden under abdominal tergites, not dissected.

Remarks: In external morphology, and in particular in colouration, similar to *E. kugleri* Freidberg, but differing in wing pattern. Its wing resembles superficially *E. iphionae* (Efftatoun) by the presence of only one hyaline spot in cell r2+3 at tip of R2+3. However, the colour of the body and the wing of *E. korneyevi* are much paler. Its two rays in dm do not reach the posterior margin of the cell as in *E. iphionae* which has as all other species of *Euarestella* described so far a more extensive dark basal wing pattern including the pterostigma, and their r1 contains at least one hyaline spot.

The new species may be included in the key of Merz (2008) as follows:

- 1 Wing with 0 or 1 hyaline spot in r1; r2+3 with hyaline spot at tip of R2+3 only **1A**
- Wing with at least 2 hyaline spots in r1; at least one hyaline spot in r2+3 distally R-M in addition to the hyaline spot at tip of R2+3 (see Merz, 2008) **3**
- 1A** Pterostigma hyaline, cell r1 entirely dark, without hyaline spot distally to R1 *Euarestella korneyevi* Merz nov. spec.
- Pterostigma at least in distal two thirds with black pattern, cell r1 at least with one hyaline spot distally to R1 (see Merz, 2008) **2**

Biology: Unknown.

Distribution: Only known from the holotype from the UAE.



Plates 1–2. 1: *Bactrocera cucurbitae* (Coquillett); 2: *Euarestella korneyevi* Merz nov. spec.

Etymology: It is my pleasure to dedicate this species to Valery Korneyev (Kiev, Ukraine) in recognition of his outstanding contributions to the taxonomy and phylogeny of Tephritidae.

***Euarestella vanharteni* Merz, 2008**

Specimens examined: Wadi Madaq, 2 ex., 3–17.ii.2008, WT, AvH. Wadi Wurayah farm, 4 ex., 22.ii–2.iii.2009, 8–15.iii.2009, 15–30.iii.2009, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

Remarks: This species was described from specimens from Wadi Madaq in the UAE (Merz, 2008) and is recorded here for the second time including a new locality, Wadi Wurayah farm. Its host plant is still unknown.

***Goniurellia lacerata* (Becker, 1913)**

Specimens examined: Khor al-Khwair, 1 ex., 15–22.iii.2007, LT, AvH. Wadi Bih Dam, 1 ex., 13–20.v.2008, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Goniurellia octoradiata* Merz, 2002**

Specimens examined: Wadi Madaq, 6 ex., 15.iii.2008, JHS. Wadi Safad, 1 ex., 15–22.iv.2006, LT, AvH. Wadi Shawkah, 14 ex., 14.iii.2008, JHS. Wadi Wurayah, 1 ex., 11–18.iii.2008, MT, AvH.

See Merz (2008) for details of its recognition and distribution.

Remarks: This species was described from Oman and later recorded from some localities in the UAE (Merz, 2008). New localities are presented here of the species. Its host plant is still unknown.

***Goniurellia tridens* (Hendel, 1910)**

Specimens examined: Desert farm, 1 ex., 12.iii.2008, JHS. Near Mahafiz, 1 ex., 21–28.viii.2006, LT, AvH. Sharjah Desert Park, 10 ex., 17–24.iii.2007, 24.iii–1.iv.2007, 15–22.iv.2007, LT, AvH; 7 ex., 12.iii.2008, JHS. Wadi Madaq, 2 ex., 3–17.ii.2008, WT, AvH. Wadi Shawkah, 5 ex., 25.x–15.xi.2007, WT, AvH. Wadi Wurayah farm, 1 ex., 17–24.iii.2009, MT, AvH.

See Merz (2008) for details of its recognition and distribution.

The following 4 species are all represented by one male only. Their terminalia were dissected and compared with the already described species. However, their identity could not be established as they show some unusual characters compared to the described species. They are probably new to science but will not be described until more specimens become available. In particular, females are needed to understand the morphology and variability of these taxa.

***Goniurellia* spec. 1**

Specimens examined: Sharjah Desert Park, 1 ex., 1–30.iv.2008, LT, AvH.

Remarks: The specimen has a similar wing pattern to *Goniurellia spinifera* Freidberg, 1980, but its terminalia are different, without the characteristic structures of the prenisetae and glans (Freidberg & Kugler, 1989).

***Goniurellia* spec. 2**

Specimens examined: Sharjah Desert Park, 1 ex., 17–24.iii.2007, LT, AvH.

Remarks: In wing pattern this male resembles *Goniurellia longicauda* Freidberg, 1980, although it shows a slight variation. The terminalia, however, are different (Freidberg & Kugler, 1989).

***Goniurellia* spec. 3**

Specimens examined: Wadi Shawkah, 1 ex., 25.v–12.vi.2008, WT, AvH.

Remarks: As does *Goniurellia persignata* Freidberg, 1980, the available specimen has only one hyaline spot in cell r1 (Freidberg & Kugler, 1989), but two rays cross cell dm, the anterior ray reaching the posterior margin of the cell, whereas the posterior ray ends at the middle of the cell.

***Goniurellia* spec. 4**

Specimens examined: Wadi Shawkah, 1 ex., 10.iii.2008, JHS (MHNG).

Remarks: This specimen is morphologically and in wing pattern similar to the previous with a *G. persignata*-type wing pattern (Freidberg & Kugler, 1989). However, both rays in cell dm cross the cell only halfway as it is typical for *G. tridens* (Hendel, 1910).

***Hyalotephritis planiscutellata* (Becker, 1903)**

Specimens examined: Sharjah Desert Park, 1 ex., 12.iii.2008, JHS.

See Merz (2008) for details of its recognition and distribution.

***Katonaia aida* Hering, 1938**

Specimens examined: Wadi Madaq, 1 ex., 18–28.xi.2007, WT, AvH. Wadi Wurayah farm, 1 ex., 15–30.iii.2009, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Metasphenisca negeviana* (Freidberg, 1974)**

Plate 3

Specimens examined: Wadi Madaq, 2 ex., 18–28.xi.2007, 20.ii–2.iii.2009, WT, AvH. Wadi Wurayah, 1 ex., 5–30.xi.2008, WT, AvH.

Recognition: Freidberg & Kugler (1989).

Distribution: Described from Israel and later recorded from Egypt, Jordan, Saudi Arabia and Yemen (Freidberg & Kugler, 1989; Korneyev & Dirlbek, 2000; Merz & Dawah, 2005; Merz et al, 2006). New record for the UAE. This is the easternmost record of this species.

***Metasphenisca* spec. cf. *tetrachaeta* (Bezzi, 1918)**

Specimens examined: Wadi Madaq, 21 ex., 18–28.xi.2007, 20.i–3.ii.2008, 3–17.ii.2008, WT, AvH. Wadi Shawkah, 3 ex., 30.vi–2.viii.2007, 15.x–15.xi.2007, WT, AvH; 4 ex., 14.iii.2008, JHS.

See Merz (2008) for details of its recognition and distribution.

***Rhochmopterum* spec.**

Plate 4

Specimens examined: Wadi al-Sidr, farm, 1 ex., 17.iii.2008, JHS (MHNG).

Remarks: The genus is in bad need of a revision. So far, 14 species have been described from the Afrotropical, Australasian and Oriental regions, but at least 14 species, mainly from the Afrotropical region, are yet to be described (Freidberg, 2002). A safe identification of the single male available is therefore not possible and it is left unnamed.

***Schistopterum moebiusi* Becker, 1903**

Specimens examined: Sharjah Desert Park, 1 ex., 1–30.iv.2008, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Sphaeniscus trifasciatus* Korneyev & J. Dirlbek, 2000**

Plate 5

Specimens examined: Wadi Shawkah, 1 ex., 17.viii–11.ix.2008, WT, AvH. Wadi Wurayah, 1 ex., 5–30.xi.2008, WT, AvH.

Recognition: Korneyev & Dirlbek (2000).

Distribution: Described from Jordan. New record for the UAE. Recently, one male from Oman (Jebel Akhdar, 1900 m, 23°14′/57°12′E, 9.v.1991, leg. M.D. Gallagher, MHNG) was sent to the author by John Deeming which is a new record for this country. Its occurrence in the UAE is therefore not a surprise. Its host plant is yet unknown.

***Trupanea amoena* (Frauenfeld, 1857)**

Specimens examined: Desert farm, 4 ex., 12.iii.2008, JHS. Dibba, 2 ex., 21.iii.2007, sweep-net, leg. F. Menzel & A. Stark. Khor al-Khwair, 1 ex., 15–22.iii.2007, LT, AvH. N of Ajman, 2 ex., 15–16.iii.2009, WT, leg. C. Schmid-Egger. Near Mahafiz, 2 ex., 4–11.iv.2006, LT, AvH. Sharjah Desert Park, 70 ex., 17–24.iii.2007, 24.iii–1.iv.2007, 1–8.iv.2007, 15–22.iv.2007, 23–30.iv.2007, 1–30.iv.2008, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 26.iv–3.v.2006, LT, AvH. Wadi Bih, 1 ex., 29.iii.2007, sweep-net, leg. F. Menzel. Wadi Bih dam, 3 ex., 22–26.iii.2009, WT, AvH. Wadi Madaq, 4 ex., 3–17.ii.2008, WT, AvH. Wadi Shawkah, 2 ex., 1–7.iv.2007, 5–12.v.2007, WT, AvH. Wadi Wurayah farm, 3 ex., 15–30.iii.2009, LT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Trupanea pulcherrima* (Eflatoun, 1924)**

Specimens examined: Dibba, 1 ex., 21.iii.2007, sweep-net, leg. F. Menzel & A. Stark. Fujairah, 1 ex., 1–8.iv.2006, LT, AvH. Near Mahafiz, 2 ex., 4–11.iv.2006, LT, AvH. Sharjah Desert Park, 22 ex., 17–24.iii.2007, 24.iii–1.iv.2007, 1–8.iv.2007, 15–22.iv.2007, 23–30.iv.2007, 12–21.v.2007, 30.iv–25.v.2008, LT, AvH; 1 ex., 12.iii.2008, JHS. Sharjah-Khor Kalba, near tunnel, 8 ex., 26.iv–3.v.2006, 3–18.v.2006, LT, AvH. Wadi Bih dam, 4 ex., 22–29.iii.2007, 6–13.v.2007, 13–20.v.2008, 22–26.iii.2009, LT & WT, AvH. Wadi Madaq, 2 ex., 6–13.v.2006, LT, AvH. Wadi Shawkah, 1 ex., 18.iii.2007, sweep-net, leg. F. Menzel & A. Stark. Wadi Shawkah, 4 ex., 1–7.iv.2007, 5–12.v.2007, 30.vi–2.viii.2007, WT, AvH; 1 ex., 10.iii.2008, JHS. Wadi Wurayah farm, 7 ex., 15.i–22.ii.2009, 15–30.iii.2009, LT & MT, AvH.

See Merz (2008) for details of its recognition and distribution.

***Trupanea stellata* (Fuesslin, 1775)**

Specimens examined: Desert farm, 4 ex., 12.iii.2008, JHS. Masafi, farm, 1 ex., 17.iii.2008, JHS. N of Ajman, dunes with mangroves, 4 ex., 11.iii.2008, JHS. Ra's al-Khaimah, farm, 2 ex., 16.iii.2008, JHS.



Plates 3–4. 3: *Metasphenisca negeviana* (Freidberg); 4: *Rhochmopterum* spec.

S of Ra's al-Khaimah, coast, 3 ex., 11.iii.2008, JHS. Sharjah Desert Park, 52 ex., 20.x–24.xi.2007, 24.xi–22.xii.2007, 14.ii–1.iv.2008, LT, AvH. Um al-Quwain, salt marsh, 2 ex., 18.iii.2008, JHS. Wadi Bih dam, 4 ex., 19.ii–1.iii.2008, 1–6.iii.2008, 6–17.iii.2008, LT, AvH. Wadi Madaq, 58 ex., 18–28.xi.2007, 3–17.ii.2008, 20.ii–2.iii.2009, WT, AvH. Wadi Shawkah, 3 ex., 10.iii.2008, 14.iii.2008, JHS. Wadi Wurayah farm, 11 ex., 15.i–22.ii.2009, 22.ii–2.iii.2009, LT, AvH.
See Merz (2008) for details of its recognition and distribution.

***Trupanea tubulata* Munro, 1964**

Plate 6

Specimens examined: Dibba, 1 ex., 21.iii.2007, sweep-net, leg. F. Menzel & A. Stark. Near Mahafiz, 1 ex., 4–11.iv.2006, LT, AvH. Sharjah Desert Park, 2 ex., 17–24.iii.2007, 23–30.iv.2007, LT, AvH.

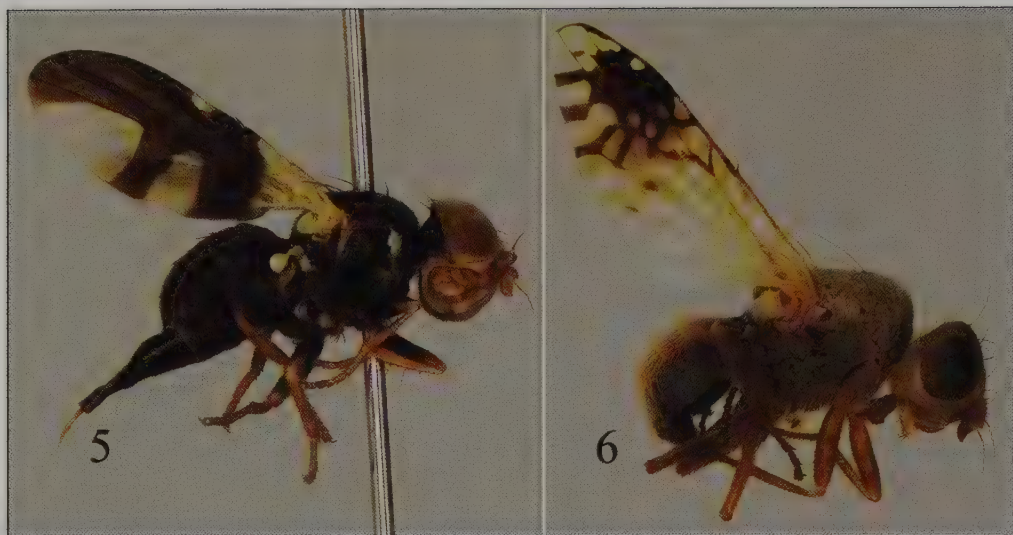
Recognition: Freidberg & Kugler (1989).

Distribution: Widely distributed in the Afrotropical region and also recorded from Israel and Spain (Freidberg & Kugler, 1989). New record for the UAE.

DISCUSSION

In the present supplement 29 species are recorded from the UAE, 24 of which could be named. One species is newly described. In this contribution 5 named species are new records for the UAE, increasing the checklist to 32 species. In addition, at least 5 species which represent further new species for the country remain unnamed. Compared to the first contribution 19 species could be found again, but 5 named and the 5 unnamed species were not among the specimens studied before.

A brief analysis of the results shows that *D. semisphaereus* is the most abundant species with 157 specimens collected, followed by three species of *Trupanea* (*stellata*, *amoena*,



Plates 5–6. 5: *Sphaeniscus trifasciatus* Korneyev & J. Dirlbek; 6: *Trupanea tubulata* Munro.

pulcherrima), all represented by more than 50 specimens. Only one or two specimens were found for about half of the species. This frequency is similar to the results of the collecting efforts in previous years with the same 4 most abundant species (Merz, 2008). It is remarkable that *D. semisphaereus* was found again so abundantly because it was known from less than 10 specimens before this study (White, 2006). Based on specimens from the UAE it was recently possible to give first information about the morphology of the male (White & Goodger, 2009). Here, new localities are recorded which give an indication of its widespread distribution in the country and probably also in surrounding areas. All specimens in the Sharjah Desert Park were attracted by light, which is unusual behaviour for Tephritidae, but for the first time it was also possible to find the species in a Malaise trap and in water traps. However, its host plant is still unknown and needs further investigation. The species which are recorded here for the first time for the UAE are all represented by 1–4 specimens only. Such a result may indicate that still numerous species are waiting to be discovered with more field work.

Concerning the used collecting methods it can be seen from the data that 15 species were collected with traps only (light traps, Malaise traps, water traps), 11 species with traps and by general sweeping, and 3 species were found by general sweeping with an insect net (*Goniurellia* spec. 2, *Hyalotephritis planiscutellata*, *Rhochmopterum* sp.) but are not known from the traps. The remarkable high number of 14 species which were swept by general sweeping during a comparatively short period by non-specialists of the family Tephritidae is a good sign that this method is very efficient in collecting a wide diversity of Tephritidae, and more efforts with the insect net will surely increase the number of species known for the country. On the other hand, many species, and among them all 5 new named and 3 unnamed species for the UAE, were obtained with traps only. It seems that traps are efficient in desert areas, and they provide some good information about the phenology for the species attracted. In more temperate regions, for instance in Central Europe, traps allow for collecting only a small number of specimens and species (personal observations). According to the experience

of researchers of Tephritidae they are best collected either specifically on their host plants, or by rearing them from the plants, both methods have not yet been used. Also, many species are rarely found in the field because of their short flight period, which is strongly synchronized with the development of their host plants.

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Author's address:

B. Merz, Muséum d'histoire naturelle, C. P. 6434, CH-1211 Geneva 6, Switzerland; e-mail: bernhard.merz@ville-ge.ch

Order Diptera, family Odiniidae

Stephen D. Gaimari

INTRODUCTION

The family Odiniidae (superfamily Opomyzoidea) represents a small group of robust and strongly bristled flies. The adults are closely associated with trees, particularly those exuding sap or infested with other insects. Where biology is known, most species feed within galleries of wood-boring beetles as saprophages and predators, although thorough reviews of known biology and larval stages are provided by Kirk-Spriggs & Barraclough (2009) and Gaimari & Mathis (in press). The latter paper also has a key to the genera of the world. Of the 14 extant genera, fewer than 70 species have been described and many geographical gaps exist, including the Arabian Peninsula. No species have been recorded in the literature from any country on the peninsula, or in the countries of North Africa bordering the Red Sea and the Gulf of Aden. The published records for the family closest to the UAE are in Turkmenistan, with three of the five described species of *Turanodinia* Stackelberg, 1944, occurring there (Krivosheina & Krivosheina, 1996). For the genus *Odinia* Robineau-Desvoidy, 1830, the closest published records are in Bulgaria (Beschovski & Georgiev, 1993; Máca, 1987), Ukraine (Korneyev, 1997; Korneyev, 2003), and Greece (Máca, 2007), and an unidentified species is recognized here from southern Turkey.

MATERIALS AND METHODS

The specimen from the UAE is deposited in the California State Collection of Arthropods (CSCA), Sacramento, California, USA, in the hope that additional specimens, particularly males, will be collected in the near future. The specimen from Turkey belongs to the Zoologische Staatssammlung, Munich, Germany.

SYSTEMATIC ACCOUNT

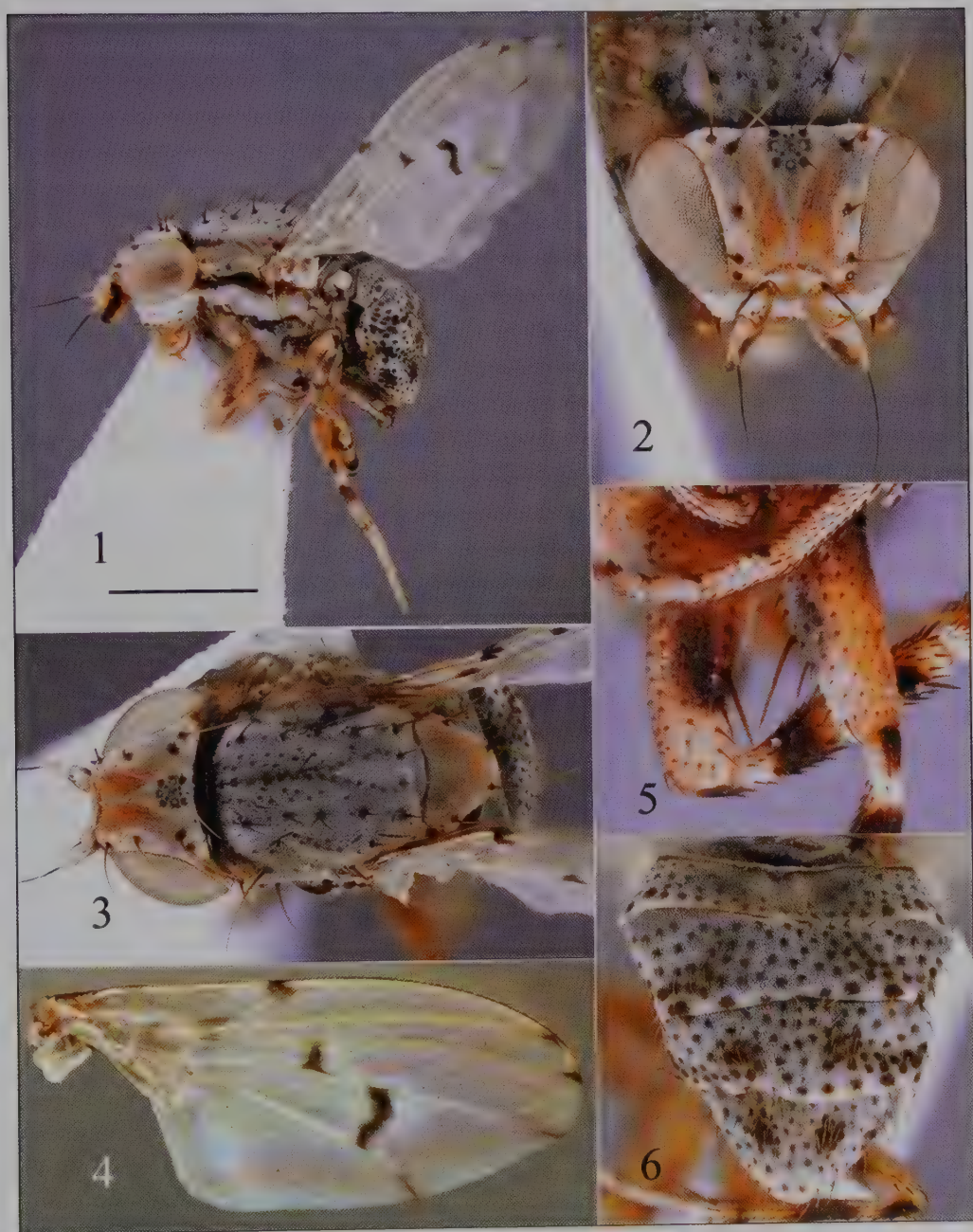
Subfamily **Odiniinae** Hendel, 1920 (Type genus: *Odinia* Robineau-Desvoidy, 1830)

Genus ***Odinia*** Robineau-Desvoidy, 1830 (Type species: *Odinia trinotata* Robineau-Desvoidy, 1830)

***Odinia* spec.**

Specimen examined: Sharjah Desert Park, 1♀, 8–15.iv.2007, light trap, leg. A. van Harten.

Remarks: Because the single specimen is female, identifying it to species is impossible. However, recording even the presence of the family in the UAE is a significant contribution to understanding the distribution of the group, and will undoubtedly lead to further specimens being discovered in the Arabian Peninsula. Although a typical *Odinia* in most respects, there are several notable morphological characteristics in this species, including the following, hopefully to aid recognition of the male when it is collected. All macrosetae and setulae are distinctly pale yellowish-brown (Plates 1–3, 5–6). The wings have the typical dark marks on the crossveins and the tip of vein R_1 , but also have dark marks at the tips of veins R_{2+3} , R_{4+5} , M_1 and CuA_1 (Plate 4), which is not unique, but is worth noting. A most unusual wing



Plates 1–6: *Odinia* spec. from the UAE. 1: Habitus, lateral view; measure bar = 1 mm; 2: Head, anterodorsal view; 3: Thorax and head, dorsal view; 4: Wing; 5: Hind femora, anterior view; 6: Abdomen, posterodorsal view.



Plate 7. *Odinia* spec. from the UAE, habitus. (Photograph © James Turner / NMWC)

characteristic is the S-shaped curvature of crossvein dm-cu (Plate 4). The hind femur has two distinct strong bristles on the anteroventral surface, with the more medial seta being about twice the length of the more distal seta (Plate 5).

Additional material of *Odinia*: TURKEY, 1♂, Antalya Province, W.-Taurus, 1100 m, 30 km N of Alanya, 14–28.vii.2001, leg. M. Hiermeier. The preceding specimen represents the geographically closest record to the UAE for *Odinia* and for the family Odiniidae, and is only provided as a country record. This specimen represents a different species than the one from the UAE discussed in this paper.

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Author's address:

Stephen D. Gaimari, California Department of Food and Agriculture, Plant Pest Diagnostics Branch, 3294 Meadowview Road, Sacramento, California 95832, USA; e-mail: sgaimari@cdfa.ca.gov

Order Diptera, family Chloropidae

John C. Deeming

INTRODUCTION

Commonly known as the ‘grass flies’, this name gives a very restricted perception of what is undoubtedly a very diverse biology. Although many species develop in grasses and cereal crops, either as shoot flies, seed flies or feeders in the frass of other insects, others develop as predators of root aphids, as egg parasites of spiders, mantids and acridids, subdermal parasites in frogs, mollusc feeders, decaying vegetation feeders, litoral organic debris feeders, gall-formers in reeds and as inquilines in such galls.

Apparently, no species of the family has ever been recorded from the United Arab Emirates.

MATERIALS AND METHODS

Unless otherwise stated all material is dry-mounted, although much of it was originally collected into alcohol, in which case it has been dehydrated in absolute alcohol and transferred to ethyl acetate for at least one day before mounting. Holotypes are deposited in the collection of the National Museum of Wales. Other material is divided between that collection and the UAE Invertebrate Collection; representatives of the Oman material are deposited in the Natural History Museum of Oman, Al Khuwair. Further material has been borrowed from the Senckenberg Museum and the Oxford University Museum.

Although this paper predominantly is about the Chloropidae of the UAE, data about specimens from other countries of the Arabian Peninsula as well as from other countries of the region have been included when available to the author.

Abbreviations used: UAE = United Arab Emirates; LT = light trap; MT = Malaise trap; WT = water traps; JCD = leg. J.C. Deeming; MDG = leg. M.D. Gallagher; AvH = leg. A. van Harten.

TAXONOMIC ACCOUNT

Subfamily **Oscinellinae** Becker, 1910

Tribe **Scoliophthalmini** Nartshuk, 1983

Genus ***Scoliophthalmus*** Becker, 1903

This genus is widely distributed in the warmer parts of the Old World. The larvae develop in shoots of cereals and grasses.

Scoliophthalmus micans Lamb, 1918.

Specimens examined: Bithnah, 1♂, 4.vii–12.viii.2006, LT, AvH. OMAN: Ghul, 1♂, 1♀, 2.xi.1990, on forage sorghum under date palms, MDG & JCD. Hayl al Ghaf, 1♂, 6.xi.1992, on weedy cultivation under palms, MDG & JCD. Wadi Bani Kharus, Istal, 5♂, 1♀, 19.xi.1992, on poor heading sorghum under palms, MDG & JCD.

Remarks: The above record from the UAE is the most westerly for this oriental species, which is also recorded from the islands of Réunion and Rodrigues.

Tribe Oscinellini

Genus *Anacamptoneurum* Becker, 1903

A small genus confined to the warmer parts of the Old World.

Anacamptoneurum obliquum Becker 1903.

Specimens examined: Bithnah, 1♀, 31.xii.2005–2.ii.2006, LT, AvH. OMAN: Ghul, 1♂, 2♀, 2.xi.1990, on forage sorghum under date palms, MDG & JCD; 1♂, same data but on irrigated forage *Pennisetum* under date palms. Wadi Mu'aydin, 12♂, 3♀, 1.xi.1990, on flowering *Saccharum griffithii* in wadi bed, MDG & JCD. YEMEN: Bani Husheish, 3♂, 2♀, 12.v.1991, from maize ear, leg. M. Mahyoub. Al-Kadan, 1♀, 3.xii.1997–17.ii.1998, MT, AvH & H.M. Naser. Al-Kowd, 1♂, ix.2003, LT, AvH. TURKEY: Bornova-Izmir, 2♂, 15.iv.1994, on wheat, leg. H.S. Civelek.

Remarks: Described from Egypt, this species is widespread in Africa and its range extends east to India. In the Arabian Peninsula it is recorded from Saudi Arabia and Israel. It has been reared from various cereal crops, sugar cane and wild grasses and is most likely a scavenger, feeding in the frass of stem-boring Lepidoptera.

Genus *Aphanotrigonum* Duda, 1932

Species of this genus are frequently reared from grasses, though they appear to be scavengers following up attack by other organisms.

Aphanotrigonum subfasciella Collin, 1949

Specimens examined: 7 km S of al-Jazirat al-Hamra, 1♂, 29.xii.2004, AvH. Sharjah Desert Park, 1♂, 4–8.xii.2004, WT, AvH; 1♂, 4♀, 29.iii–6.iv.2005, LT, AvH. NARC, near Sweihan, 1♂, 14–28.iii.2005, LT, AvH. OMAN: Izki, Harat al Rahah, 4♀, 17.xi.1992, on seedling wheat, JCD. Nizwa, Al Modebi, 3♂, 3♀, 7.xi.1992, ratooned clumps of forage *Pennisetum*, JCD. Shist, oasis, 18°15'N53°39'E, 3♂, 7♀, 12.xii.1996, MDG. Muscat, Al Khuwair, 1♀, x.1990, JCD. Batinah, Sohar, Al Elounat, 4♂, 1♀, 6.xii.1992, open weedy Rhodes grass field, JCD. Hayl al Ghaf, 7♂, 6♀, 6.xi.1992, weedy cultivation under palms, MDG & JCD. YEMEN: 12 km NW of Manakhah, 1♀, 15.v–24.vi.2003, MT, AvH. LEBANON: 20 km NE of Tripoli, Nahr el-Bared, 1♂, 17.ix.2000, leg. M.R. Wilson. INDIA: A.R., Hyderabad, 1♂, 28.x–4.xi.1971, leg. A.C. Pont & JCD. NIGERIA: Zaria, Samaru, 8♂, 6♀ (some with puparia), iii–iv.1969, ex *Hyparrhenia cyanescens* shoots, JCD; 1♂, emerged 6.iv.1969 ex shoot *Cyperus* spec., JCD; 1♂, emerged 6.ix.1968 ex guinea corn (sorghum) shoot, JCD.

Remarks: Described from Egypt, whence the late Dr. El-Serwy reared it from sugarcane damaged by *Scrobipalpa ocellatella* (Boyd, 1858) and recorded it from dead heart in wheat.

Aphanotrigonum femorella Collin, 1946

Specimens examined: Sweihan, 1♀, 13.ii.2007, leg. A. Saji. Al-Ajban, 1♂, 26.iii–4.iv.2006, MT, AvH. OMAN: Dhofar, mangrove creek with grass, 17°01'N54°12'E, 2♀, 10.xii.1996, MDG. Dhofar, Mughsail saltmarsh, huge series of both sexes, 11.xi.1990, swept from *Sporobolus virginicus*, JCD. Dhofar, Khor Rawri, 6♂, 1♀, 12.xi.1992, *Sporobolus virgatus* with *Paspalum* admixture, JCD. Dhofar, Khor Taqah, 7♂, 1♀, 12.xi.1992, on carpet grazed *Sporobolus virgatus*, JCD. TURKEY: Mugla, Dalyan, Istuzu saltmarsh, 1♂, 1♀, 14.vii.1997, leg. M.J. Ebejer. TUNISIA: Tabarka, river mouth, 1♂, 2♀, 13.v.1995, JCD. MALTA: Ghadira, 1♂, 2♀, 5.v.1988, leg. M.J. Ebejer.

Remarks: Described from England and widespread in Europe east to Russia. All of the localities listed here are coastal apart from Sweihan and al-Ajban.

Genus *Arcuator* Sabrosky, 1985

This is a small Old World genus, principally of the Afrotropical and Oriental regions. Nothing is known of larval biology.

Arcuator nigerensis Sabrosky, 1985

Specimens examined: Al-Ajban, 1♂, 23–30.xi.2005, LT, AvH; 1♀, 10–17.x.2005, LT, AvH. Near Mahafiz, 1♀, 21–28.iii.2006, LT, AvH. Wadi Bih dam, 1♂, 1–9.i.2010, WT, AvH. Wadi Madaq, 1♂, 1♀, 26.xii.2006–20.ii.2007, MT, AvH. Wadi Safad, 2♂, 31.i–21.ii.2006, LT, AvH. YEMEN: Al-Kadan, 1♂, LT, AvH & T. Abdul Haq. Al-Kowd, 1♂, ix.2003, LT, AvH & S. Al Haruri. Al-Lahima, 1♂, 1.i–9.iv.2001, MT, AvH. Lahj, 1♂, xi.1999, MT, AvH & A. Sallam; 1♂, ix.2000, MT, AvH & A. Sallam. 12 km NW of Manakhah, 2♂, 3♀, 15.v–24.vi.2003, MT, AvH; 1♂, 1♀, 24.vi–4.viii.2003, AvH. SAUDI ARABIA: Aseer, Keratha, Al-Ethrebany farm, 1♂, 15.v–11.vi.2006, MT, leg. H.A. Dawah. Aseer, Maraba, 1♂, 1–31.xii.2004, MT, H.A. Dawah. Tehama-Tanoma, Al-Bekera village, 2♂, 20.i.2003, leg. H.A. Dawah. OMAN: Muscat, Bowsher dunes, 1♀, 8.ii.1990, leg. M.J. Ebejer. Ruwi, Wattayeh, 1♂, 1–7.iv.1988, MDG. Al Khuwair, 1♀, 5–7.xi.1987, leg. M.J. Ebejer; 1♀, 4.iv.1988, M.J. Ebejer. MALI: Mourdiah, 1♂, 12♀, 3–12.x.1986, leg. M. Matthews.

Remarks: Described from Niger, Nigeria and Senegal.

Genus *Cadrema* Walker, 1859

Native to the warmer parts of the World, this genus has species that have been reared from decaying molluscs, dung and decaying vegetable matter.

Cadrema pallida (Loew, 1866)

Specimens examined: N of Ajman, 3♀. 16.ix–22.x.2006, WT, AvH; 3♀, 11–25.xi.2006, WT, AvH; 3♂, 6♀, 15–16.iii.2009, WT, leg. C. Schmid-Egger. Ar-Rafah, 1♂, 1♀, 9.iii.2010, leg. T. Zatwarnicki. YEMEN: Mukalla, 5♂, 6♀, vi.2003, LT, AvH & M. Hubeishan. OMAN: Dhofar, Khor Salalah, 1♂, 1♀, 11.xi.1992, on *Paspalum vaginatum*, JCD.

Remarks: Described from Cuba, this is a circumtropical species. On the Seychelles it has been reared from honeydew on *Ficus* leaves, most likely finding nourishment in the wind-blown debris and moulds that develop in the honeydew.

Genus *Calamoncosis* Enderlein, 1911

An Old World genus, the larvae of which develop in reeds, sometimes as inquiline in the galls of *Lipara* Meigen, 1830, species on *Phragmites*.

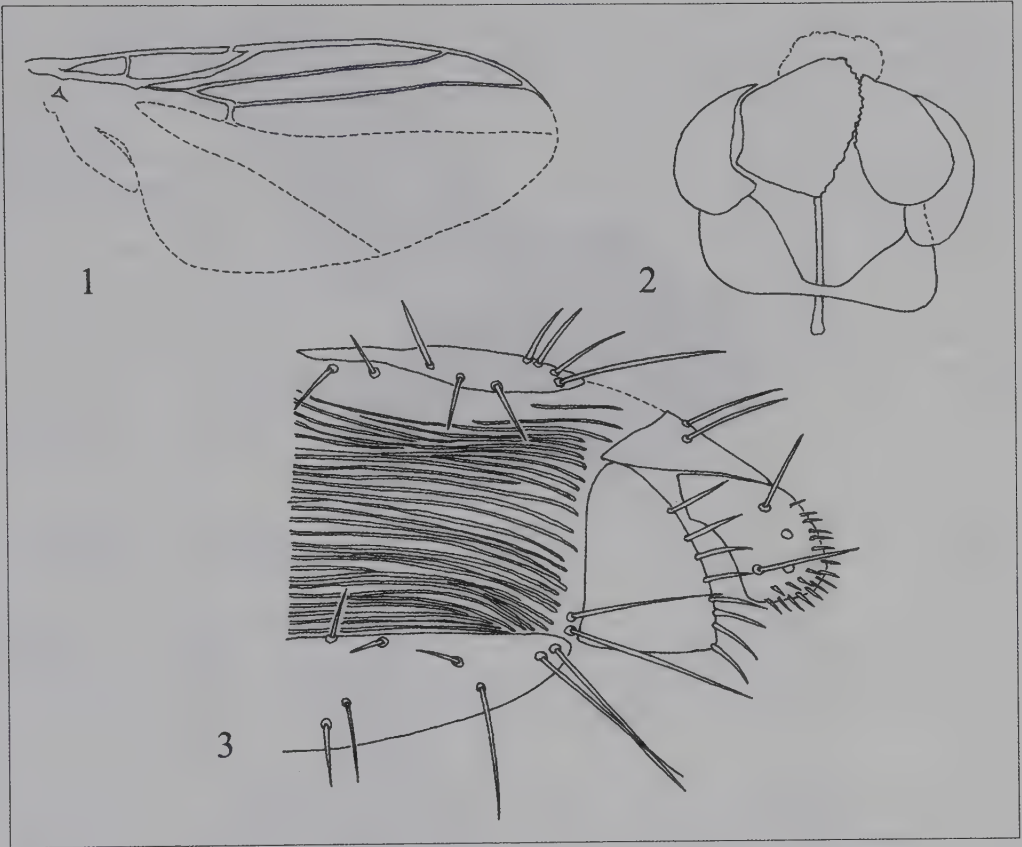
Calamoncosis abbreviata Deeming **nov. spec.**

Plates 1–2, Figures 1–3

Specimens examined: Holotype: ♂, United Arab Emirates, Um al-Quwain, pond [25°32'N 55°32'E], 15.iii.2010, leg. T. Zatwarnicki. Paratypes: 1♀, same data as holotype; 3♂, same locality but 12.iv–7.vi.2009, WT, AvH; 9♂, 11♀, 28.ii.2010, leg. T. Zatwarnicki. 1♀, N of Ajman, 11–25.xi.2006, WT, AvH. 1♂, 1♀, ar-Rafah, 17.iii.2009, WT, leg. C. Schmid-Egger; 1♀, 9.iii.2010, leg. T. Zatwarnicki. 4♂, 1♀, S of Ra's al-Khaimah, on beach, 25–26.iii.2008, WT, AvH. BOTSWANA: 1♂, 1♀, Tlokwen, 6–13.ii.1990, MT, leg. J.M. Mashonja.

Description: A black species, dirty yellow on antenna with exception of arista, on fore margin of frons, face, parafacialia, all knees, apex of foretibia and on basal three segments of all tarsi; dusting dark grey, weak wherever developed; wing milky white in male, slightly greyish hyaline in female, the costa, radial veins and anterior crossvein strongly developed and brown, the veins posterior to these unpigmented and weakly developed; haltere dirty white with knob more or less infusate; chaetotaxy black throughout.

Head as long as high with frontofacial angle a little projecting and vibrissal angle obtuse, the weak vibrissa situated well above mouth margin; gena narrower than the postocular strip at its widest part, as wide as the length of the swollen base of arista and twice as wide as cheek at its narrowest point; frons twice as long as broad, parallel-sided; frontal triangle short, dusted, extending laterally to mid point between posterior ocellus and eye margin, with a single row of weak hairs on either lateral margin, the ocellar bristles reclinate, much stronger but hardly



Figures 1–3. *Calamoncosis abbreviata* nov. spec. 1: Wing; 2: Male genitalia, surstyli; 3: Female, ovipositor segments.

longer than these hairs; postocellar bristles long, as long as half frons width and slightly longer than the external verticals, the internal vertical bristle neither longer nor stronger than the frontal setulae; third antennal segment short and very pointed; proboscis narrow, geniculate, when folded projecting slightly in front of mouth margin. Thorax shiny, dusted only on scutellum; mesonotum densely and uniformly covered with setulae, chaetotaxy: 1 very weak humeral, 1+2 notopleural, 1 postalar and 1 prescutellar dorsocentral bristle; scutellum conical, a little shorter than length of alula, dorsally convex, lacking a marginal rim, haired on disc as is mesonotum, with one pair each of long apical, shorter lateral and minute subbasal marginal bristles. Legs, including coxae and abdomen more or less dusted. Wing with even distribution of microtrichia except at extreme base; costa extending midway between apices of R4+5 and M1+2 (Fig. 1). Length of male 1.6 mm, of female (with ovipositor retracted) 2.0 mm.

Male with large rounded surstyli with minutely serrate apical rims (Fig. 2), when viewed at right angles to their planes with a more rounded appearance than in the Figure.

Female with the three ovipositor segments combined as long as the rest of the abdomen, the most apical segment slightly longer than either of those preceding it, bearing the usual groups



Plates 1–2. *Calamoncosis abbreviata* nov. spec. 1: Male, 2: Female. (Photographs © James Turner / NMWC)

of forwardly-directed tiny spicules and longitudinal striae in the membrane common to species of this genus, the supraanal and subanal plates (Fig. 3) very short, about one tenth of the length of the preceding segment, the short rounded cerci with minute hairs and a few short bristles.

Differential diagnosis: A distinctive species characterized by the abbreviated costa, the radial veins concentrated towards the fore margin, the lack of a posterior crossvein and the distinctive male genitalia, the surstyli being almost round. The male wing is milky white, whereas that of the female is slightly greyish hyaline. The abbreviated costa separates it from all other described species of the genus.

Remarks: This abbreviation of the costa is certainly not unique among Oscinellinae, appearing also amongst some species of *Dicraeus* and *Scoliophthalmus*. With its chloropine-like wing venation and pointed third antennal segment this species could easily be mistaken for a species of the genus *Xena* Nartshuk, 1964, but the gena is much narrower and the surstylus is not fused to the epandrium.

Etymology: From the Latin *abbreviare*, indicating the shortened costa.

Genus *Dicraeus* Loew, 1873.

A large and cosmopolitan genus, the larvae feed on the forming seeds of grasses and cereals.

Dicraeus (Oxyapium) bothriochloae Nartshuk, 1978

Specimens examined: N of Ajman, 1♂, 11–25.xi.2006, WT, AvH. OMAN: Wadi Bani Khalid, Halfah, 9♂, 16♀, 26.x.1990, grasses and forage *Pennisetum* under palms, MDG & JCD. Wadi Mu'aydin, 8♂, 6♀, 1.xi.1990, on flowering *Saccharum griffithii* in wadi bed, MDG & JCF. SAUDI ARABIA: Aseer, Maraba, 1♂, 1–31.xii.2004, MT, leg. H.A. Dawah. INDIA: A.P., Hyderabad, 1♂, 22.x–4.xi.1971, leg. A.C. Pont & JCD.

Remarks: Described from Turkmenia and further recorded from Tadjikistan. The material from Wadi Mu'aydin and Maraba appears to be a pale form of this species, being black only on the ocellar prominence. I can find no difference between it and other material in the structure of the male genitalia, nevertheless the identification must remain tentative.

Genus *Epimadiza* Becker, 1910.

There are several published records of larvae of this genus developing in egg pods of Acrididae and others from vegetable material, sometimes decaying.

Epimadiza nigrescens Duda, 1933.

Specimens examined: Al-Ajban, 1♀, 1.iv–2.v.2006, MT, AvH; 1♀, 17–24.iv.2006, MT, AvH; 1♀, 5–12.vi.2006, MT, AvH; 3♀, 19–26.vi.2006, MT, AvH. N of Ajman, 1♀, 21.ix–25.x.2007, WT, AvH. Bithnah, 1♂, 31.xii.2005–2.ii.2006, LT, AvH. NARC, near Sweihan, 1♀, 2–30.iv.2005, LT, AvH. Um al-Quwain, 1♀, 12.iv–7.vi.2009, WT, AvH. Wadi Madaq, 1♀, 27.vi–29.vii.2006, MT, AvH. Al-Wathba, 1♀ 29.xi.2004, aerial net, leg. A. Saji. YEMEN: 12 km NW of Manakhah, 12♀, 3.vii–21.viii.2001, MT, AvH; 1♂, 1♀, 5.v–17.vi.2002, MT, AvH; 1♀, 15.v–24.vi.2003, MT, AvH; 1♀, 4.viii–15.ix.2003, MT, AvH. Sana'a, 1♀, iv.1992, AvH. OMAN: Ghubra Bowl, 1♀, 5.xi.1992, on *Pteropyrum sceperium* (Polygonaceae), MDG & JCD. Muscat, Al Khuwair, 1♀, x.1990, JCD.

Remarks: Described from Israel, this species is widely distributed in Africa and has been reported from Saudi Arabia by Dawah & Abdullah (2006: 26). In Nigeria it has been reared from sorghum shoots and in Niger from a millet head.

Genus *Hapleginella* Duda, 1933

This genus is known from the northern palaearctic *H. laevifrons* (Loew, 1858) and the nearctic *H. conicola* (Greene, 1918), both of which differ from the species described here in

having only a single longitudinal row of setae on either side on the disc of the frontal triangle and the first basal cell noticeably broader at three fifths of its length than at apex. A third species, *H. coxata* Collin, 1966, was described from the northern Adriatic coast of Italy, but was so unusual in its narrow shape and lack of basal cells in the wing that its describer only tentatively assigned it to this genus. It has the fore coxa and all trochanters yellow. *H. conicola* has been reared in the USA from various gymnosperm cones, to which they do a great deal of damage (Keen 1958). *H. laevifrons* larvae have been found in pine cones in Europe, apparently only in those already infested by other insects (Gaidene & Narchuk, 1963). At al-Ajban, where the majority of the material of the new species was collected, are many *Pinus* trees, but of what species we have not been able to establish. Tony van Harten has kindly collected samples of the cones, but no flies have emerged from them.

***Hapleginella arabica* Deeming nov. spec.**

Figures 4–8

Specimens examined: Holotype: ♂, United Arab Emirates, al-Ajban [24°36'N 55°01'E], 1–8.iv.2006, Malaise trap, leg. A. van Harten. Paratypes: 1♂, 11♀, same data as holotype; 16♂, 28♀, same data but 1.iv–2.v.2006; 3♂, 34♀, 5–12.vi.2006; 1♂, 19–26.vi.2006; 9♂, 12♀, 26.vi–25.vii.2006; all MT, AvH. 1♀, Sharjah Desert Park, 30.vi–21.vii.2005, WT, AvH. 3♂, 1♀, Wadi Madaq, 26.xii.2005–2.i.2006, WT, AvH. 2♂, Wadi Wurayah, 14.xi–4.xii.2007, MT, AvH. 1♂, Wadi Shawkah, 5.iv–24.vi.2007, WT, AvH. OMAN: 1♀, Ruwi, Wattayeh, 1–7.iv.1988, MDG & JCD. YEMEN: 1♀, al-Kowd, 15–28.ii.1993, MT, AvH.

Description: Male. A black, partly very lightly grey dusted species with all hairs and bristles black except for hairs on tarsi, and wing veins brown, yellow on lower half of face, on lower eye margin, on fore tibia, knees of fore and mid legs, on apices of mid and hind tibiae and on tarsi; the entire antenna, clypeus and palpus are black. The haltere is whitish yellow, in a few specimens with the knob somewhat infuscate.

Head higher than long; gena only about one sixth of height of eye; frontal triangle (Fig. 4) undusted, with two longitudinal rows of bristles on its disc and many similar bristles on frontalia, a row of them almost on interface between frontal triangle and frontalia; postocellar bristles almost twice as long as ocellars; vibrissa very short and weak; antennae only narrowly separated at their bases, with only a very slight carina between; third antennal segment rounded, with a very obtuse apicodorsal angle; arista pubescent, as long as frons.

Thorax with entire pleuron and metanotum shiny; mesonotum convex with 1 long dorsocentral bristle, no enlarged prescutellar, 8 rows of setulae between the dorsocentral lines, 1 intraalar, 1 supraalar, 1+2 notopleurals and 3+5 short humeral; scutellum almost semicircular, the dorsal surface convex and covered in setulae, with two pairs of marginal bristles, the long apicals being as widely separated at their bases as the scutellum is long and the lateral marginals only half as long.

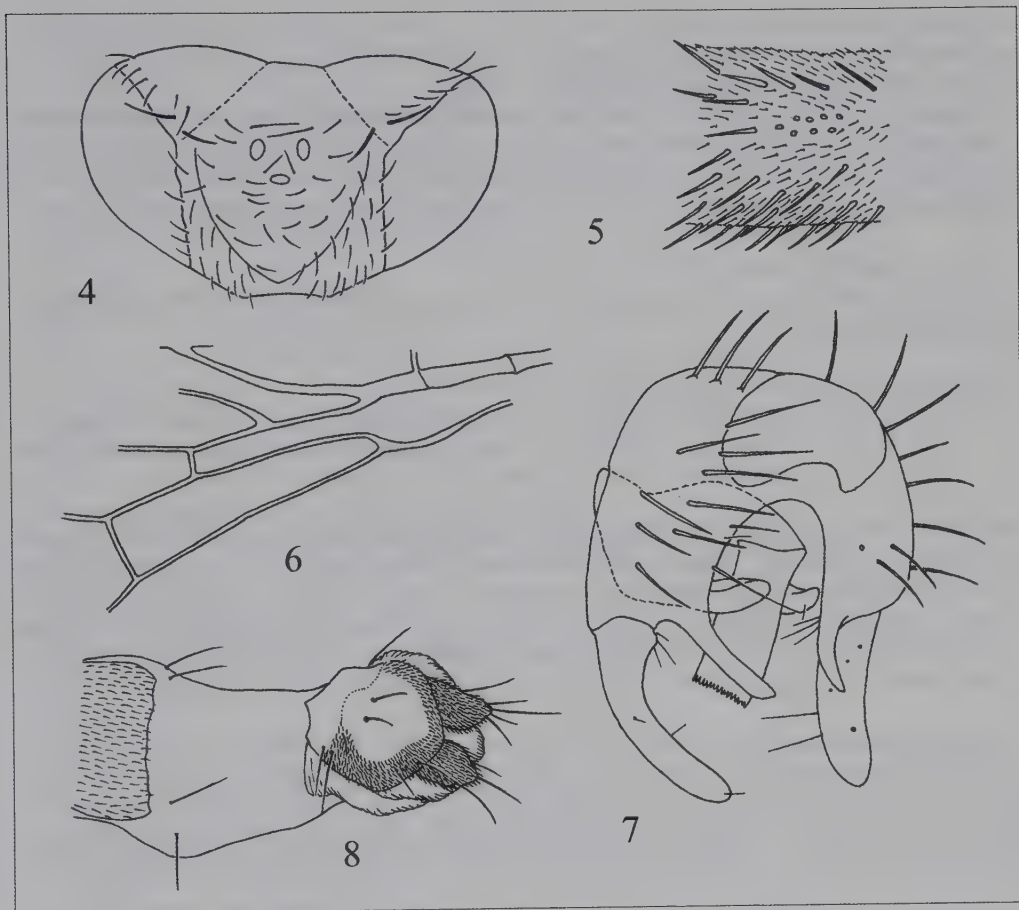
Wing hyaline; ratios of lengths of 1:2:3:4 costal sectors = 60:42:32:20, of 1:2:3 sectors of M1+2 = 30:15:70 and of 1:2 sectors of M3+4 = 45:40; R2+3 and R4+5 distinctly curved forward apically, M1+2 straight from discal cell to wing tip; posterior crossvein slightly oblique (Fig. 6); alula long.

Legs. Male mid femoral organ as in Figure 5.

Abdomen. Median part of tergite 1+2 sometimes weakly sclerotized. Sternites 3 and 4 no longer than wide, 5 weakly developed V-shaped; terminalia as in Figure 7.

Length of body and of wing about 1 mm.

Female resembling male except abdominal structure and in lacking a mid femoral organ. Tergites 1+2, 3 and 4 unremarkable, sclerotized throughout and bearing short setae; tergite 5 similar but very short, only half as long as 4; segment 5 bulbous, lacking sclerites, with a



Figures 4-8. *Hapleginella arabica* nov. spec. 4: Head, frontal view; 5: Male, midfemoral organ; 6: Part of wing; 7: Male, terminalia; 8: Female, last abdominal segments from above.

transverse row of 3 bristles at mid length on either dorsolateral surface and with membrane very finely longitudinally striate; segment 6 only two thirds as long as 5, more coarsely striate, with a narrow tergite occupying almost entire length and bearing setae apically and subapically and a yet narrower setose sternite on apical third; supraanal plate sclerotized, longer than a semicircle and bearing a pair of strong, irregularly situated setae in middle; subanal plate membranous, entirely covered in short fine compact setae identical to the clothing setae of the cerci and with longer apical setae; cerci short, ovoid, with a few bristly hairs, none of which is as long as their length (Fig. 8).

Genus *Hippelates* Loew, 1863

This genus is best known for the adult habit of persistently annoying man and livestock by feeding at eyes and wounds, and in doing so by acting as vectors of such diseases as yaws and Brazilian purpuric fever. The genus is essentially of the Americas. In Brazil ploughed-in stubble of sugar cane provides larval food. Sabrosky (1958: 340) showed the described Old World species to be a separate genus and erected *Arcuator* to accommodate them.

***Hippelates proboscideus* Williston, 1896**

Specimens examined: Dubai, Mushrif Park, 1♀, 23.ii.2006, JCD. Sharjah, 1♀, 27.iv–5.vi.2005, LT, AvH. Sharjah Desert Park, 1♀, 29.iii–5.iv.2005, LT, AvH.

Remarks: Described from St. Vincent and recorded from Texas, Georgia, Florida, Mexico, Guatemala, Costa Rica, Panama, Bahamas, Cuba, Jamaica, Puerto Rico, Trinidad, Guyana and Brazil (Bahia, Ceará). It is possible that this inadvertant introduction into Arabia has taken place in the transportation of caged gazelles from captive populations in Texas.

Genus *Lasiambia* Sabrosky, 1941

Within this small genus most species of which life histories are recorded develop in grasshopper eggs.

***Lasiambia albidipennis* (Strobl, 1893)**

Specimens examined: Sharjah, 1♂, i.2005, LT, AvH. Sharjah Desert Park, 1♀, 29.iii–6.iv.2005, LT, AvH. SAUDI ARABIA: 180 km S of Riyadh, W. Hutet Beni Tamem. Reg. A. Ibex Reserve Nat. Park, 1♂, 15.xii.2007, leg. H. Al Dhafer & Y. AL Doryhem. (King Saud University Museum of Arthropods Collection).

Remarks: This species is known only from the former Yugoslavia (“Fiume” = Rijeka, Slovenia and “Lesina” = Hvar Island off the coast of Herzegovina). In the Natural History Museum of London are the following specimens : 1♂, 1♀, det. F.I. van Emden and labelled “Jnab – Jerusalem, from stem of cabbage infested with borer larvae, emerged 1.7.1942 and 26.9.1942, P. Jolles”; 1♀, C. SPAIN: Sierra de Guadarrama, San Rafael, above tree zone. 1400–1600 m. alt., leg. A.C. Pont. “Jnab” is Arabic for South.

***Lasiambia brevibucca* (Duda, 1933)**

Specimens examined: Hatta, 2♂, 4–11.iv.2006, LT, AvH; 1♂, 11–28.v.2007, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♀, 7–14.vi.2006, LT, AvH.

Remarks: Recorded from Britain, France, Finland, Hungary, Poland, Bulgaria and European Russia, this species also occurs in Greece and Turkey. Nothing is known of its biology.

Genus *Melanochaeta* Bezzi, 1906

A widespread and large genus, the larvae usually develop in grasses and cereals.

***Melanochaeta flavofrontata* (Becker, 1903)**

Specimens examined: Hatta, 1♂, 8–26.iv.2006, LT, AvH. Sharjah, 1♂, 1–10.ii.2005, LT, AvH. Wadi Wurrayah, 2♂, 1♀, 14–26.xi.2006, MT, AvH. BAHRAIN: Adhari Pool area, irrigated farms and ditches, 1♂, 4.vi.2000, leg. C.R. Turner. OMAN: Batinah, Sohar, 2♂, 2♀, 6.xii.1992, on forage *Pennisetum*, JCD. Muscat, Qurm beach, 1♀, 23.x.1990, JCD. Wadi Daiqah, 8♂, 11♀, 27.i.1986, leg. M.J. Ebejer. Dhofar, Salalah, Dahareez, 5♂, 1♀, 8.xi.1992, swept from ratooned millet, JCD. Dhofar, Salalah, Razat Royal Farm, 13♂, 15♀, 10.xi.1992, on fodder maize exhibiting symptoms of Storey’s Disease, JCD. Dhofar, Ain Hamran, streamside vegetation, 5♂, 1♀, 10.x.1990, JCD. Dhofar, Khor Hawri, 1♂, 12.xi.1992, on *Juncus*, JCD. YEMEN: Al-Kowd, 1♂, x.2000, LT, AvH & S. Al Haruri. Ta’izz, 1♂, ix.1999, LT, AvH & A. Awad. LEBANON: Nahr el-Bared, 20 km N of Tripoli, 1♀, 2.vi.2001, JCD.

Remarks: Widespread in the Afrotropical region, this species is also known from Egypt and Israel.

Genus *Meijerella* Sabrosky, 1976

A small genus confined to the warmer parts of the Old World and Pacific. Not yet found in the UAE, but likely to occur there.

***Meijerella flavisetosa* Sabrosky, 1976**

Specimens examined: YEMEN: Al-Kadan, 7♂, 4♀, v. 2002, LT, AvH & T. Abdul Haq. Al-Kowd, 1♂, 4♀, viii.1999, LT, AvH & S. Al Haruri; 2♂, 2♀, iii.2000 LT, AvH & S. Al Haruri. SRI LANKA: Uva Prov., Monaragalla Distr., Pelwatta Sugar Estate, 1♂, 1♀, 27–29.iii.2000, at light, leg. M.R. Wilson. MALAYSIA: Sabah, Bukit Monkobo, 2♀, 11–23.viii.1987, MT, leg. A.H. Kirk-Spriggs.

Remarks: Described from Hawaii, Malaysia, Mariana Is., Guam and Bonin Is. With one rearing from the decaying stem of rice and one from fruit of *Touchardia* spec. (Urticaceae) its describer suspected the larvae to be scavengers.

Genus *Oscinella* Becker, 1909

Best known for the ‘frit fly’, *Oscinella frit* (Linnaeus, 1758), a serious pest of oats (*Avena sativa*), reported as early as 1861 by Lilljeborg attacking cereals in Sweden. This species (*O. frit*) is a shoot fly that also produces an autumn generation that feeds on the forming seeds in much the same way as do larvae of *Dicraeus*. It is a large and taxonomically difficult genus with a wide distribution of species.

***Oscinella (Paroscinella) acuticornis* Becker, 1912**

Specimens examined: Dubai, Mushrif Park, 2♂, 2♀, 23.ii.2006, JCD. Fujairah, 1♂, 8–29.iv.2006, LT, AvH. Hatta, 1♂, 4–11.iv.2006, LT, AvH. Jebel Jibir, 1♀, 27.iii.2007, leg. F. Menzel & A. Stark. Sharjah Desert Park, 1♂, 29.iii–6.iv.2005, LT, AvH; 1♂, 24.iii–1.iv.2007, LT, AvH. Wadi Shawkah, 2♂, 20.iii.2007, leg. F. Menzel.

Remarks: Further description, explanatory notes and distribution of this species and the next listed are given by Deeming (2003: 82–88).

***Oscinella (Cyclocercula) nartshukiana* Beschovski, 1978**

Specimens examined: Al-Ajban, 10♂, 5♀, 1.iii.2006, on Rhodes grass (*Chloris gayana*), JCD; 1♀, 6–22.v.2006, MT, AvH. Dubai, 7♂, 3♀, Mushrif Park, 23.ii.2006, JCD. Hatta, 1♂, 1♀, 8–26.iv.2006, LT, AvH; 1♂, 14–21.vi.2006, LT, AvH. Ra's al-Khaimah, 20♂, 8♀, 13.iii.2010, leg. T. Zatwarnicki. Sharjah Desert Park, 1♀, 21–29.iii.2005 LT, AvH; 2♂, 24.iii–1.iv.2007, LT, AvH; 1♂, 15–22.iv.2007 LT, AvH; 1♂, 25.v–15.vii.2008 LT, AvH. Wadi Bih dam, 3♂, 1–19.i.2010, WT, AvH. Wadi Madaq, 1♂, 4–15.ii.2006, WT, AvH; 4♂, 1–8.v.2006, LT, AvH.

***Oscinella (Oscinella) nitidigenis* (Becker, 1908)**

Specimens examined: Wadi Hayl, 4♂, 6.iii.2010, leg. T. Zatwarnicki.

Remarks: Described from Teneriffe, Canary Islands, this species is widespread in Africa and the warmer parts of Europe east to India. In the Arabian Peninsula it has been recorded from Yemen and Oman. Known distribution, hostplants and descriptive notes are given by Deeming, 2003.

Genus *Pselaphia* Becker, 1911

A tropical Old World genus that resembles *Conioscinella* Duda, 1929, except that the third antennal segment is enlarged. Although only three species are described, at least 22 African species exist and many of these exhibit sexual dimorphism in the shape of the third antennal segment, though not the two species listed below. Nothing is known of biology or life-histories.

***Pselaphia cornifera* Becker, 1912**

Specimens examined: Hatta, 1♂, 4–11.iv.2006, LT, AvH. Um al-Quwain, 1♂, 12.iv–7.vi.2009, WT, AvH. Wadi Asimah, 1♀, 8.iii.2010, leg. T. Zatwarnicki. YEMEN: 12 km NW of Manakhah, 2♀,

21.viii–28.x.2002, MT, AvH; 1♂, 2♀, 15.v–24.vi.2003, MT, AvH. SAUDI ARABIA: Al Bahah, Al Mukhwah, 742 m alt., 1♀, 18.v.2010, leg. Al Dhafer & El Torkey (King Saud University Coll., Riyadh). Remarks: Described from Ethiopia.

***Pselaphia flava* Sabrosky, 1957**

Specimens examined: Al-Ajban, 1♂, 17.x–9.xi.2005, MT, AvH; 1♂, 28.xii.05–26.ii.2006, MT, AvH. Hatta, 1♀, 16–30.viii.2006, LT, AvH. Ra's al-Khaimah, 2♀, 25–26.iii.2008, WT, leg. J. Bosák. Sharjah Desert Park, 1♀, 6–28.xii.2006, pitfall trap, AvH; 1♀, 24.iii–1.vi.2007, LT, AvH. Wadi Bih dam, 1♂, 1–19.i.2010, WT, AvH. Wadi Wurayah, 3♀, 14–26.xi.2006, MT, AvH; 3♀, 8 ex. (teneral), 10–26.xii.2006, WT, AvH.

Remarks: Described from a single male from the Cape Verde Islands.

Genus ***Sabroskyina*** Beschovski, 1987

A small genus of species formerly included in *Oscinella* Becker. Little is known of biology, though *S. aharoni*, as a swarming fly, has been found to be an annoyance in Sudan.

***Sabroskyina aharonii* (Duda, 1933)**

Specimens examined: Fujairah, 3♂, 2♀, 8–29.v.2006, LT, AvH. Hatta, 1♂, 4–11.iv.2006, LT, AvH. Sharjah Desert Park, 1♂, 29.iii–6.iv.2005, LT, AvH; 1♂, 20.x–24.xi.2007, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♀, 7–14.vi.2006, LT, AvH. Wadi Bih dam, 1♀, 24.iv–1.v.2007, LT, AvH. Wadi Wurayah, 2♂, 14.xi–4.xii.2007, MT, AvH. BAHRAIN: Adhari Pool ditch, 2♀, 1♂, 14.vi.2000, leg. C.R. Turner. YEMEN: Al-Kowd, 1♂, 15–28.ii.1993, MT, AvH; 1♀, x.2000, LT, AvH & S. Al Haruri; 1♀, LT, i–iii.2003, LT, AvH & S. Al Haruri. Lahj, 1♂, 17.v–15.vi.2000, MT, AvH & A. Sallam. 12 km NW of Manakhah, 1♀, 6.vii–21.viii.2002, MT, AvH. Al Kadan, 1♂, 3.xii.1997–17.ii.1998, MT, AvH & H.M. Naser. OMAN: Batinah, Shinas, 2♂, 3♀, 7.xii.1992, on mango foliage, JCD. Wadi Abyad, 3♂, 1♀, 16.ix.1988, swept from moist sand in dense shade beneath old disused palm and oleander grove near perennial running water, leg. M.J. Ebejer. Hayl al Ghaf, weedy cultivation under palms, 3♂, 1♀, 6.xi.1992, MDG & JCD. Wadi Bani Kharus, foothills of Jebel Akdar, Ulyah, 1♀, 18.x.1990, at light, MDG & JCD. Muscat, Al-Khuwair, 1♂, 5–9.i.1988, leg. M.J. Ebejer. Muscat, Baushar, boulder-strewn dry chasm, 7♂, 14♀, 14.xi.1992, JCD. Batinah, Sohar, on squash, 1♀, 6.xii.1992, JCD. TURKEY: Mugla, Dalyan Istuzu saltmarsh, 1♂, 2♀, 14.vii.1997, leg. M.J. Ebejer. Mugla, Köycegiz, 1♀, 12.vii.1997, JCD. SEYCHELLES: Cousine, 1♂, 1.iv.2001, leg. J. Gerlach.

Remarks: Described from Israel and recorded from Saudi Arabia, Afghanistan, Iraq, Pakistan; Egypt, Sudan, Niger, Chad and Cape Verde Islands.

Genus ***Trachysiphonella*** Enderlein, 1936

A small and little-known genus, there are no recorded life histories. The adult type material of the Greek species *T. pori* Harkness & Ismay, 1976, was found feeding on gore of ants being preyed upon by spiders.

***Trachysiphonella carinifacies* Nartshuk, 1964**

Specimens examined: Khor Kalba, mangroves, 1♂, 3.iii.2010, leg. T. Zatwarnicki. YEMEN: Sana'a, 1♂, 1♀, iii–iv.1991, AvH; 1♂, ii.1993, MT, AvH.

Remarks. Described from Mongolia and further recorded from Kazakhstan and Tajikistan.

Genus ***Tricimba*** Lioy, 1864

A large and cosmopolitan genus. Little, however, is known of its biology.

***Tricimba (Tricimba) bimarginata* Sabrosky, 1979**

Specimens examined: Wadi Shawkah, 1♀, 30.vi–2.viii.2007, WT, AvH. YEMEN: Al-Kadan, 2♀, i.2003, LT, A. van Harten & T. Abdul Haq. 12 km NW of Manakhah, 3♀, 3.vii–21.vii.2001, MT, AvH;

1♂, 5.v–17.vi.2002, MT, AvH; 1♂, 4.viii–15.ix.2003, MT, AvH. Ar-Rujum, 1♀ 9.vi–5.vi.2001, MT, AvH. Ta'izz, 1♂, v–vi.2002, LT, AvH & A.R. Al Yarimi.

Remarks: Described from the Comoro Islands, this species has been recorded from SW Saudi Arabia by Dawah & Abdullah (2006: 28).

***Tricimba (Nartshukiella) humeralis* (Loew, 1858)**

Specimens examined: Al-Ajban, 1♂, 15.iii.2010, leg. K. Mahmood. Dubai, Mushrif Park, 1♂, 1♀, 23.ii.2006, JCD. 7 km S of al-Jazirat al-Hamra, 1♀, 29.xii.2004, WT, AvH. Um al-Quwain, 1♂, 12.iv–7.vi.2009, WT, AvH. Wadi Wurayah, 1♂, 1♀, 10–26.xii.2006, WT, AvH. OMAN: Jebel Akhdar/Jebel Shams, 1900 m alt., 1♀, 13.vi.1992, on flowering *Ochradenus*, MDG. Nizwa, Al Modebi, 1♀, 17.xi.1992, from ratooned clump of forage *Pennisetum*, JCD. Al-Khuwair, 1♀, 5–7.xi.1987, leg. M.J. Ebejer. 4 km W of Qfifa, Wadi Dima, 1♀, 25.x.1990, on *Tamarix aphylla*, MDG & JCD. Wadi Ghul, 3♀, 1.xi.1990, MDG & JCD. YEMEN: Sana'a, 1♂, i.1991, AvH; 1♂, iii–iv.1992, AvH; 1♂, 3.iv.1999, LT, AvH; 1♀, vi.1999, LT, AvH; 1♀, vii.1991, LT, AvH.

Remarks: Widespread in Europe and north Africa, its range extending from the Azores Islands to China. In the Middle East it is known from Saudi Arabia and Israel.

Subfamily **Chloropinae** Loew, 1862

Genus *Eutropha* Loew, 1866

A widespread genus whose individual species are invariably found on beaches, where they are attracted to sea-deposited decaying animal matter.

***Eutropha siphloidea* (Duda, 1930)**

Specimens examined: Khor al-Khwair, 1♀, 22.iii.2007, swept on beach, leg. A. Stark. Khor Kalba, 1♂, 3.iii.2010, leg. T. Zatwarnicki. Ar-Rafah, 20♂, 10♀, 9.iii.2010, leg. T. Zatwarnicki. Sharjah, 7♀ (6 in NHM) (as "Trucial Oman") vii.1956, leg. L.A. Tillin. OMAN: Wahiba Sands, 21°39'N 59°18'E, 1♂, 6.vii.1995, at light, MDG & B. Skule. N Masira Is., B.E.R.S. Camp, 8♂, 6♀, 5–7.iii.1995, leg. S.P. Dance. Muscat, Haramel, 2♂, 2♀, iii.1995, leg. S.P. Dance. Seeb, 11♀, 9.x.1987, at dead sardines on beach, leg. M.J. Ebejer. Seeb beach, 2♀, 16.x.1990, in crab burrow, JCD. Ra's al Ghubbah, 20°07'N 57°49'E, 1♀, 19.iv.1997, at light, MDG. Muscat, coastal dunes near Gubrah, 1♂, 5♀, 30.x.1990, at light, MDG & JCD. Muscat, Al Khuwair, 1♀, x.1990, JCD. Azaiba Coast, coastal dunes, 1♀, 2.xi.1989, leg. M.J. Ebejer.

Remarks: Described from Sri Lanka. This species exhibits sexual dimorphism in the colour of the antenna, which is yellow in the male and black in the female.

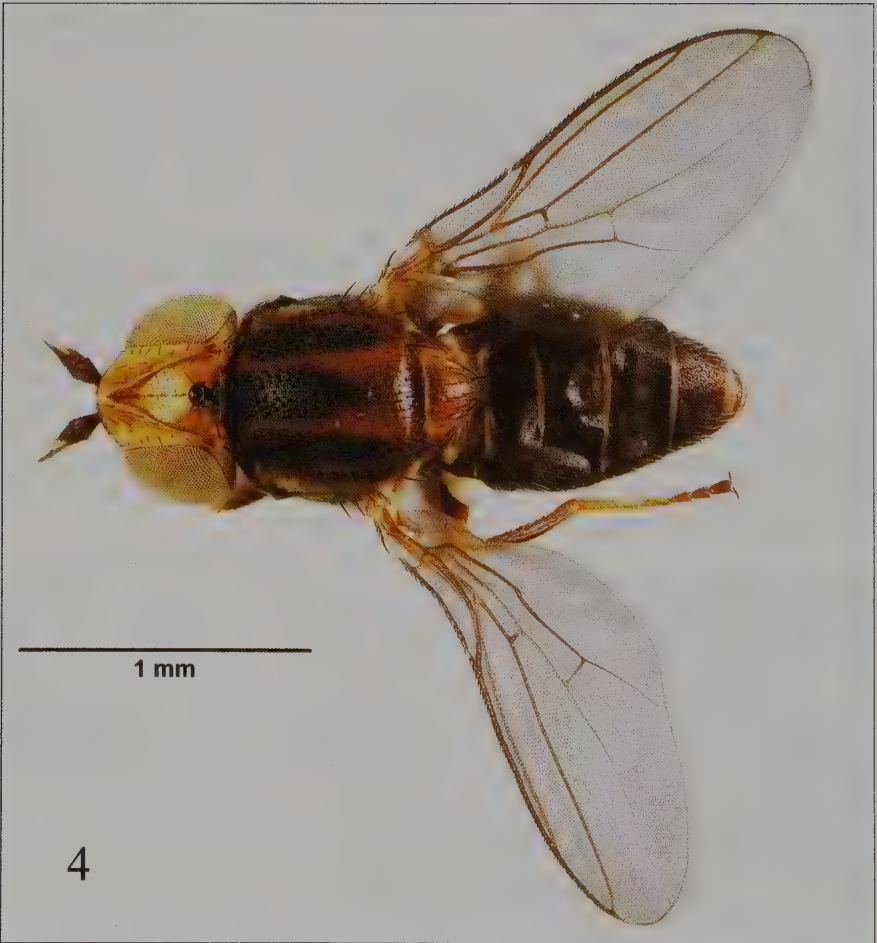
***Eutropha ? farinosa* (Becker, 1911)**

Specimens examined: N of Ajman, 2♀, 16.ix–22.x.2006, WT, AvH; 2♂, 7♀, 11–25.xi.2006, WT, AvH; 1♀, 1–20.ix.2007 WT, AvH; 1♀, 21.ix–25.x.2007, WT, AvH; 11♀, 21.iii.2007, leg. F. Menzel & A. Stark; 13♂, 12♀, 29.iii.2007, A. Stark; 3♀, 15–16.iii.2009, WT, leg. C. Schmid-Egger.

Remarks: Described from Taiwan. The presently-listed material differs from the description of the type in having the pleural markings dull yellow, but the hypopleural spot in some specimens is black.

Genus *Lagaroceras* Becker, 1903

A small genus found in the warmer parts of the Old World, the larvae of which develop in grass shoots.



Plates 3–4. *Lagaroceras curtum* Sabrosky, female. 3: Lateral view; 4: Dorsal view. (Photographs © James Turner / NMWC)

***Lagaroceras curtum* Sabrosky, 1961**

Plates 3–4

Specimens examined: Hatta, 2♀, 4–11.iv.2006, LT, AvH. Sharjah, 1♀, 24.ix–9.x.2005, LT, AvH. Sharjah Desert Park, 3♀, 20.x–24.xi.2007, LT, AvH; 2♂, 25.v–15.vii.2008, LT, AvH. Um al-Quwain, 1♂, 28.ii.2010, leg. T. Zatwarnicki. Wadi Bih dam, 18♂, 6♀, 9.iii.2010, leg. T. Zatwarnicki. Wadi Hayl, 2♂, 1♀, 6.iii.2010, leg. T. Zatwarnicki. Wadi Maidaq, 1♂, 5♀, 26.xii.2006–20.ii.2007, MT, AvH; 1♀, 27.vi–29.vii.2006, MT, AvH. OMAN: Batinah Coast, Sohar, Al Elounat, 1♀, 6.xii.1992, open weedy Rhodes grass field, JCD. Batinah, near Barka, 2♀, 15.viii.1994, MDG. Nakl, 3♂, 5♀, 18.x.1990, weedy date palm grove, MDG & JCD. Hayl al Ghaf, 1♂, 1♀, 6.xi.1992, weedy cultivation under palms, MDG & JCD. Hazm, date palm grove beside fort, 7♂, 7♀, 19.x.1990, MDG & JCD.

Remarks: Described from India, larval biology remains unknown.

Lagaroceras albolineatum* Deeming *nov. spec.

Plates 5–6

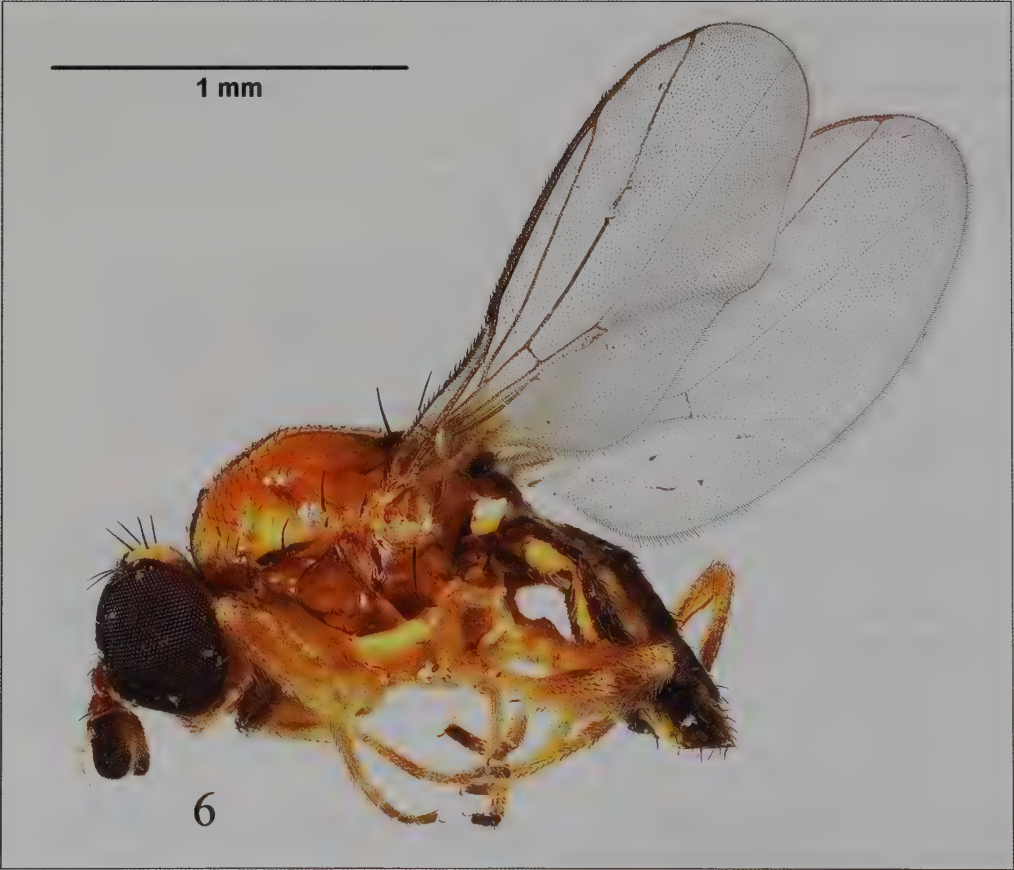
Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Wurrayah [25°24'N 56°17'E], 14–26.xi.2006, Malaise trap, leg. A. van Harten. Paratypes: 1♀, same data as holotype. YEMEN: 1♀, 12 km NW of Manakhah, 5.v–17.vi.2002, MT, AvH. 1♂, Sana'a, iii–iv.1999, LT, AvH. SAUDI ARABIA: 1♀, Aseer, Maraba, 1–31.xii.2004, MT, leg. H.A. Dawah. 1♂, Abu Aresh, Al-Mahrag Village, 1.vii–30.viii.2010, leg. H.A. Dawah. OMAN: 1♀, Muscat, Al Ansab, 26.i.1990, leg. M.J. Ebejer. 1♀, Jebel Akhdar, Sayq, 23°05'N 57°39'E, 2000m alt., vii.1995, at light, leg. B. Skule. KENYA: 1♂, 1♀, Rift Valley, Ol Arabe Gorge, 11.xi.1988, leg. R.K. Butlin.

Differential diagnosis: This species is very similar to *L. curtum* Sabrosky, sharing with it the ocellar triangle being yellow with only ocellar prominence black and the third antennal segment being shorter (not more than twice as long as its greatest depth) than in other species of the genus, but differs from it in structural and chromatic characters. *Lagaroceras andalusiacum* (Strobl, 1899) (*nov. comb.*), described into *Anthracophaga* Loew, 1866, and later transferred to *Parectecephala* Becker, 1910, also has a shorter third antennal segment, but in that species the ocellar triangle is black.

*Lagaroceras curtum***Lagaroceras albolineatum*

- | | |
|--|--|
| (1) Gena wide, almost equal to half height of eye | Gena narrow, as wide as fore tibia |
| (2) Ocellar bristles short, only half as long as vertical bristles | Ocellar bristles as long as verticals |
| (3) Median mesonotal brown vitta uniformly coloured throughout | Median mesonotal vitta shining black on a quadrate marking on anterior declivity |
| (4) Scutellum brown on disc, the rim margins obscurely paler | Scutellum dirty white on disc, the lateral corners very dark brown |
| (5) Tergites dark brown throughout | Tergites with a median line and lateral line white in strong contrast to the brown ground colour |

* topotypic material used for purposes of comparison is from INDIA: A.P., Hyderabad, 28.x–4.xi.1971, leg. A.C. Pont & J.C. Deeming.



Plates 5–6. *Lagaroceras albolineatum* nov. spec. 5: Lateral view; 6: Dorsal view (Photographs © James Turner / NMWC)

Genus *Merochlorops* Howlett in Maxwell-Lefroy, 1909

Better known by its junior synonym *Formosina* Becker, 1911, this genus is widespread in the Oriental Region and occurs also in Australia. The range of *Merochlorops lucens* (de Meijere, 1908) extends westwards as far as the islands of Rodriguez and Mauritius. The key to chloropine genera of Andersson (1977: 117–120), is misleading in that it leads specimens of *Formosina* to couplet 13 and his new genus *Globiops* (a junior synonym of *Chloropsina* Becker, 1911) on account of the presence of narrow band-shaped sclerites on either side of the anus in the male. Having overlooked these structures in *Formosina*, that genus appears in couplet 35. Kanmiya (1983: 232) states that these sclerites may be vestigially present as sockets or setae, but in the new species described below they are well developed. There are no previous Arabian records of *Merochlorops*. A new species from Yemen will be described elsewhere. In southern India *M. flavipes* (Malloch, 1927) has been reared from cardamom.

Merochlorops ceylanica (Duda, 1930)

Plates 7–8

Specimens examined: Wadi Madaq, 1♀, 26.xii.2006–20.ii.2007, MT, AvH.

Remarks: This species is known from Sri Lanka, southern India and Malaya. Two specimens in the Natural History Museum, London, one with a puparium, are labelled “INDIA: Coimbatore, 15.i.1933, boring plantain sheath, N.K. Memon” and are identified by C.W. Sabrosky.

Genus *Metopostigma* Becker, 1903

A small genus, the species are found from West Africa to Japan, often in sandy or desert regions. Nothing is known of its larval biology.

Metopostigma sabulona Becker, 1910

Plates 9–10

Specimens examined: Al-Ajban, 2♂, 3♀, 1.iii.2006, on Rhodes grass, JCD. Dubai, Mushrif Park, 1♂, 23.ii.2006, JCD. NARC, near Sweihan, 2♀, 21.ii.2006, feeding on *Cynomorium coccineum* flowerhead, JCD. OMAN: Salalah, 2♀, 24.iv.1992, leg. MDG. Salalah, Khawr Dahareez, 2♂, 4♀, 24.iv.1992, MDG. Muscat, Bandar al Jissah, 1♀, 10.xii.1992, m.v. trap, MDG & JCD. Marmul, Desert Agric. Project, 3♂, 5♀, 29–30.1.1989, MDG; 3♂, 8♀, 21.xi.1992, swept from Rhodes grass (*Cloris gayana*), JCD. Wadi Ma'awil, inland dunes, 2♀, 26.xii.1989, leg. M.J. Ebejer. Harat al Rahah, 5♀, 17.xi.1992, on ratooned heading millet, JCD; 2♀, 17.xi.1992, on seedling wheat, JCD. Muscat, Al Ansab, 1♂, 23.ii.1989, leg. M.J. Ebejer. Batinah, Sohar, 1♂, 5.xii.1992, on grass, JCD; 1♀, same data but on forage *Pennisetum*. Sohar, Al Elounet, 1♀, 6.xii.1992, open weedy Rhodes grass field, JCD. Batinah, Rumais, weedy egg plant plot, 1♀, 5.xii.1992, JCD. Dhofar, Razat Royal Farm, 1♀, 10.xi.1992, on fodder maize, JCD. Plain near Razat, 6♂, 5♀, 24.iv.1992, MDG. Seeb, artificial water hole in seasonal marsh, 1♀, 22.xi.1987, leg. M.J. Ebejer. 4 km W. of Qfifa, Wadi Dima, 1♂, 1♀, 25.x.1990, on *Tamarix aphylla*, MDG & JCD. YEMEN: Al-Kowd, 1♀, xi.2000, LT, AvH & S. Al Haruri. 12 km NW of Manakhah, 2♀, 24.vi–4.viii.2003, MT, AvH. Ar-Rujum, 1♀, 16.x.2000–15.i.2001, MT, AvH & A.M. Hager. Sana'a, 2♀, ii.1991, AvH; 2♀, vii.1991, LT, AvH; 1♀, iv.1992, AvH; 1♂, i.1993, AvH. Suq Bani Mansour, 3♀, 28.viii–26.ix.2001, MT, AvH. TUNISIA: Jendouba, Oued Mellegue, 1♂, 11.v.1995, leg. M.J. Ebejer.

Remarks: Described from three examples from the Simony collection from Port Said, Egypt and recorded from Israel, Saudi Arabia and Pakistan. In describing this species Becker stated (p. 155) “Ich würde diese Exemplare für eine dunkel Farbenvarietät von *tenuiseta* Lw. halten, wenn nicht die Fühler deutlich länger wären.”

Genus *Neoloxotaenia* Sabrosky, 1964

A small genus restricted to the warmer parts of the Old World. Not yet recorded from the UAE, but the occurrence in the country is quite possible.



Plates 7–8. *Merochlorops ceylanica* (Duda), female. 7: Lateral view; 8: Dorsal view. (Photograph © James Turner / NMWC)



Plates 9–10. *Metopostigma sabulona* Becker, female. 9: Lateral view; 10: Dorsal view. (Photographs © James Turner / NMWC)



Plate 11. *Neoloxotaenia gracilis* (de Meijere), male, lateral view. (Photograph © James Turner / NMWC)

Neoloxotaenia gracilis (de Meijere, 1908)

Plate 11

Specimens examined: YEMEN: Tihama, Al Mudammar, Bait-al-Faqih, 1♂, 15.ii.1992, leg. M. Mahyoub. Al-Kadan, 2♂, v.2002, LT, AvH & T. Abdul Haq; 2♂, 3♀, i.2003, LT, AvH & T. Abdul Haq. Al-Kowd, 1♂, 15–28.ii.1993, MT, AvH; 1♂, iii.2000, LT, AvH & S. Al Haruri; 2♂, vii–ix.2001, LT, AvH & S. Al Haruri; 1♂, 1♀, i–iii.2003, LT, AvH & S. Al Haruri; 2♀, ix.2003, LT, AvH & S. Al Haruri. Lahj, 1♂, viii.2000, MT, AvH & A. Sallam; 1♂, i.2001, MT, AvH & A. Sallam; 1♀, ii.2001 MT, AvH & A. Sallam. Seyun, 1♂, xi.2002, light trap, AvH & G. Ba Saheh.

Remarks: Described from Java under the name of *Lagaroceras gracile*, this species is further recorded from Sri Lanka, Taiwan, India, Malaya, Philippines, Sumatra, Thailand, Japan and Hawaii. In India it has been reared from the spice cardamom (Zingiberaceae).

Genus *Pachylophus* Loew, 1858

A large Old World tropical and subtropical genus having a most unusual reproductive strategy and developing in large grasses and cereals. Females have one ovary completely atrophied and the remaining one bearing a single ovule. The egg produced is so large that it



Plate 12. *Pachylophus gallagheri* nov. spec., female, dorsal view. (Photographs © James Turner / NMWC)

occupies most of the abdominal cavity. The larva hatches internally, is nourished on secretions from the accessory glands and is deposited onto a suitable hostplant. *Pachylophus beckeri* Curran, 1928, a pest of rice, upon pupariation plugs its anterior spiracles into the aerenchyma of the adjacent rice leaf and so escapes drowning in the event of inundation (Deeming, 1974).

***Pachylophus gallagheri* Deeming nov. spec.**

Plates 12–13

Specimens examined: Holotype: ♂, OMAN: Nakl, weedy date palm grove, 18.x.1990, leg. M.D. Gallagher & J.C. Deeming. Paratypes: 25♂, 24♀, same data as holotype. 1♀, Hazm, date palm grove beside fort with maize, sorghum and grass cultivation, 19.x.1990, MDG & JCD. 1♂, 4♀, Wadi Bani Kharus, foothills of Jebel Akhdar, Ulyah, 23°11'N 57°40'E, 810 m alt., 18.x.1990, m.v. light, MDG & JCD. 3♂, Wadi Bani Kharus, Istal, 19.xi.1992, on sorghum, MDG & JCD. 1♀, Muscat, Bowsher, date palm grove, 28.x.1990, MDG & JCD. 2♂, 2♀, Fanja, grasses, sedge and low herbage at wadi bed and mud at water's edge, 24.vii.1988, leg. M.J. Ebejer. 1♂, 2♀, Batinah, Rumais, weedy egg plant plot, 5.xii.1992, JCD; 1♀, 5.xii.1992, on beet spinach, JCD. 1♂, Batinah, Sohar, on lawn, 5.xii.1992, JCD. 1♂, Sad, Baushar, 2.i.1992, MDG. UNITED ARAB EMIRATES: 1♀, al-Ajban, 2–9.iv.2006, LT, AvH. 5♀, Fujairah, 8–29.v.2006, LT, AvH; 10♂, 19♀, 20–27.v.2006, LT, AvH. 1♀, Hatta, 4–11.iv.2006, LT, AvH; 3♀, 14–21.vi.2006, LT, AvH. 6♂, 5♀, Sharjah, 27.iv.2010, suction sampler, AvH. 1♂, Sharjah Desert Park, 7–16.v.2005, LT, AvH. 1♂, 5♀, Um al-Quwain, 12.iv–7.vi.2009, WT, AvH. 1♂, 2♀, Wadi Bih dam, 9.iii.2010, leg. T. Zatwarnicki. SAUDI ARABIA: 2♂, Riyadh, 20.xii.1978, leg. S. Talhouk; 3♀, 10.ii.1979; 2♂, 4♀, 1.vi.1980. 1♂, Al Karj, 26.ix.1979. 1♀, Al-Dawseer, Al-Joba village, 1.iii–30.iv.2005, MT, leg. H.A. Dawah. PAKISTAN: 1♂, 3♀, Gilgit, 35°55'N 74°20'E, 1615 m, 24.vii.2000, on flowers, leg. D.J. Mann & G. McGavin.

Description: A short-headed species with frontal triangle, entire occiput, clypeus, two broad facial lines, dorsum of antenna, arista, thorax and tergites black, the pleura extensively shiny, legs testaceous and a conspicuous field of grey dust on either side of the anterior ocellus extending in the form of an inverted V almost to lateral margin.



Plate 13. *Pachylophus gallagheri* nov. spec., female, lateral view. (Photographs © James Turner / NMWC)

Male. Head yellow in ground colour, deeper than long; combined cheek plus jowl rather narrow, at narrowest point hardly wider than the arista and light grey dusted throughout; face weakly grey dusted, shiny on a median triangle on lower two thirds of its height; occiput weakly grey dusted; internal vertical bristle much longer than the external; palpus yellow; frontal triangle flat, extending three quarters of the way from the anterior ocellus to anterior margin of frons, its sides slightly sinuate and a little longer than its base; third antennal

segment of moderate length. Mesonotum and entire humerus and notopleuron dark grey dusted, the first with indications of slightly paler dusted dorsocentral lines; the usual one long posterior notopleural and postalar bristle present, but the prescutellar dorsocentral minute; scutellum apically rounded with a pair of widely-separated convergent marginal bristles and a fine hair lateral to each, its surface shagreened; mesopleura lacking fine setulae. Legs testaceous with tarsi somewhat darkened; hind tibia with posterodorsal sensory area occupying one third of its length. Wing greyish hyaline with brown veins and base weakly yellowish up to humeral crossvein; squama and fringe ochrous; haltere yellow. Abdomen black, the tergites subshiny through weak grey dust.

Length about 2.0 mm, of wing 1.95 mm.

Female resembling male, the cerci dirty yellow.

Differential diagnosis: This species is most closely-related to *Pachylophus rohdendorfi* Nartchuk, 1962, described from China, differing from it in the following respects:

Pachylophus gallagheri

Pachylophus rohdendorfi

- | | |
|--|--|
| (1) Face largely black in ground colour | Face entirely yellow |
| (2) Thorax black throughout | Thorax brown marked with dirty yellow |
| (3) Ocellar bristles minute, no longer than the postocellars | Ocellars long, longer than the external vertical |
| (4) Frontal triangle with a field of grey dust extending almost to lateral | Frontal triangle only grey dusted on ocellar prominence margin |
| (5) Gena conspicuously narrower than width, including plumosity, of arista | Gena as wide as arista |

Further material of *P. rohdendorfi* is: 1♂, 1♀, compared with holotype, THAILAND: Doi Suthep N.P., 4.xii.1985, leg. K.A. Spencer; 2♀, Bangkok, 15.xi.1985, leg. K.A. Spencer; 1♂, JAVA: Jogya, on rice, iii.1982, leg. M.R. Wilson; 1♂, HONG KONG S.A.R., New Territories, Luk Keng, grassy ditch, 15.v.2007, leg. J.C. Deeming.

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Author's address:

Dr. J.C. Deeming, National Museum of Wales, Cathays Park, Cardiff CF10 3NP, UK; e-mail: John.Deeming@museumwales.ac.uk

Order Diptera, infraorder Muscomorpha

Cyclorrhaphous Diptera associated with vertebrates in the UAE

Rolf K. Schuster & John C. Deeming

INTRODUCTION

In the explosion of species of schizophorous Cyclorrhapha in the Cretaceous period many groups of higher flies specialized in developing in animal corpses. The next stage was to infest wounds in living animals. This has led to healthy animals becoming infected, sometimes leading to blindness or death by secondary infection or interrupted feeding due to distress and a resulting worsening of condition. Some flies have become very specialist in their choice of hosts, whereas some others have adapted to attack a range of hosts. Such attacks are termed 'myiasis' and may involve infestation of the alimentary canal, nose, nasal sinuses, pharynx, eye sockets, skin, urinogenital system and any wound available. Domestic animals seem to be particularly prone to such infestations, possibly due to stresses that would not affect wild animals, such as ox-ploughing or burden-bearing and also that they are unable to select their food. Perhaps the earliest comprehensive record of such problems can be found in the book of Exodus, chapter 8 (the second book of Moses) dealing with a plague of flies and the resulting murrain of beasts (myiasis in domestic animals) in the Nile Valley of Egypt 3,500 years ago.

Myiasis in an ibex in the UAE is reported upon by Deeming (2009a).

Although not strictly causers of myiasis, some blood-feeding Hippoboscidae are included here for the sake of convenience.

Pollock (2010) recently has shown that the Oestridae, Hippoboscidae and Glossinidae, all of which were regarded as falling within the Calypttratae, in reality have an Ephydroidea derivation within the Acalypttratae.

MATERIALS AND METHODS

Most of the material upon which this paper is based was obtained from necropsies carried out at the Central Veterinary Research Laboratory in Dubai. Since some of these were of animals that had died or had to be destroyed shortly after importation, some species not normally encountered in the UAE have been collected. Adults and larvae were collected into alcohol and some larvae were reared to adulthood. Specimens are deposited in the National Museum of Wales, Cardiff and the UAE Invertebrate Collection. Specimens from the collection of the Natural History Museum, London, were used for comparison.

The abbreviation 'BCEAW' refers to the Breeding Centre for Endangered Arabian Wildlife at the Sharjah Desert Park, and 'CVRL' refers to the Central Veterinary Research Laboratory in Dubai.

SYSTEMATIC ACCOUNT

Family Calliphoridae

Chrysomya bezziana Villeneuve, 1914

Specimens examined: CVRL, 2♂, 1♀, labelled "Lamb wound myiasis". This lamb was three weeks old and born from a ewe in a group of sheep used as blood donors for blood agar media at the CVRL

(25°12'40"N 55°17'16"E). Multiple larvae were removed from the abdominal skin and muscles in May 2005. Larvae apparently of the same species were found in a camel originating from the same place in April 2007.

Distribution, biology and hosts: Widespread in the Afrotropical region and occurring also in the Oriental and Australasian regions, this species is commonly known as the 'Old World Screwworm Fly'. It is an obligatory wound parasite. It was reported by Deeming (1996: 275) reared from a human leg ulcer in Oman. Myiasis due to this species has been found in man, cattle, water-buffalo, sheep, goats, horses, donkeys, dogs, camels and elephants.

Chrysomya bezziana was recorded from Fujairah by Brown et al. (1998).

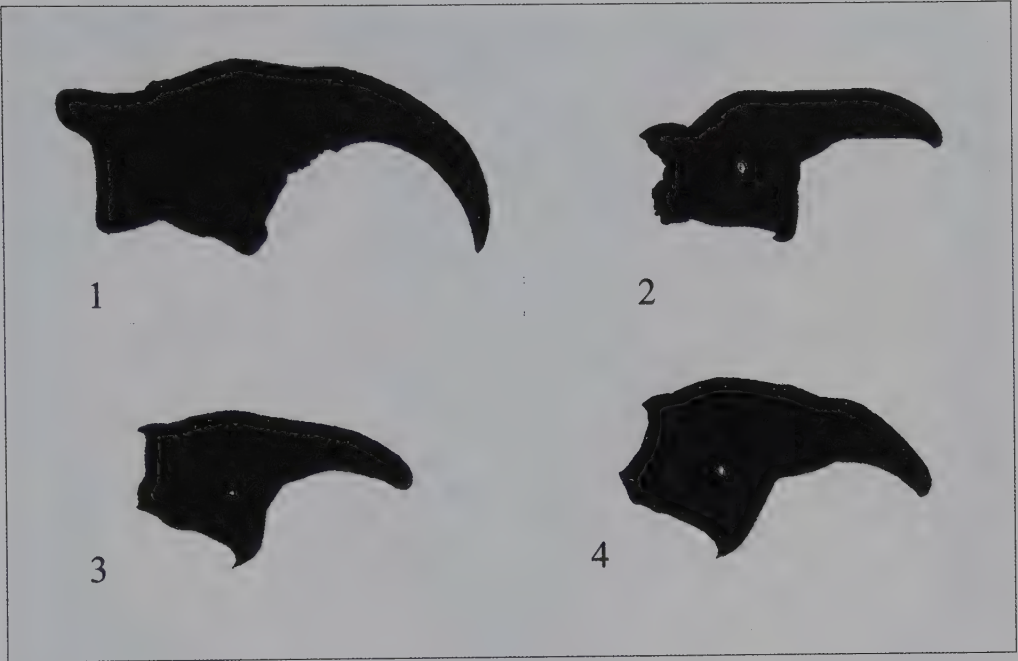
Family Sarcophagidae

Wohlfahrtia spec. *nuba* group

Specimens examined: CVRL, 5 third instar larvae labelled "Ex wound in face of Thomson's gazelle, October 2005". The gazelle was born and kept in the Nadd al-Shiba Palace in Dubai (25°08'38"N 55°20'63"E).

Remarks: According to Verves (1985: 312–329) six species of *Wohlfahrtia* Brauer & Bergensstamm, 1889, are responsible for myiasis occur in the Middle East. These are: (1) *W. nuba* (Wiedemann, 1830) whose range extends from Senegal and Morocco east through the Mediterranean to India and Pakistan, attacking man, donkeys, camel, sheep, Testudines and lizards; (2) *W. trina* (Wiedemann, 1830) which extends from Guinea and the Cape Verde Islands to Sudan and Mongolia and attacks vertebrates; (3) *W. meigeni* (Schiner, 1862) which has a holarctic distribution excepting colder parts and attacks mammals and frogs; (4) *W. magnifica* (Schiner, 1862) found from Spain and North Africa and Central Europe east to China and Mongolia, which is an obligatory parasite and a serious pest of livestock and also parasitizes birds and man. For this Verves (1986: 120) gives as Middle-Eastern records Israel, Syria, Jordan and Saudi Arabia; (5) *W. indigens* Villeneuve, 1928, which extends from the Canary Islands to Central Asia and which attacks donkeys and camels; (6) *W. bella* (Macquart, 1839), which extends from NW Africa and southern Europe and the Sudan east to Mongolia and NW China and of which there is a record of it attacking a mouse.

Larval descriptions do not exist for *W. trina* and *W. indigens*. Zumpt (1965: 110) stated that no infestations of *W. magnifica* in wild animals had come to his notice. Comparison of the mandibular sclerite of the third instar cephalopharyngeal skeleton of the larvae from Thomson's gazelle (*Eudorcas thomsonii*) from Dubai (Fig. 2) with that of a Hungarian *W. magnifica* (Fig. 1) excluded the possibility of it belonging to that species. McGowan et al. (2001) recorded *W. nuba* as attacking the eggs of loggerhead and green turtles in northern Cyprus. The mandibular sclerite from one of these puparia (Fig. 3) was compared with that of the larvae from Dubai and the two were found to be similar. A reared *W. indigens* female in the Natural History Museum, London, labelled "Saudi Arabia; Burriman, coll. 15.iii.[19]56, em. 5.iv.56 ex baited hopper, J. Roffey" has an incomplete puparium in a gelatin capsule pinned beneath it. This still has the cephalopharyngeal skeleton attached, which is figured here (Fig. 4) and is removed to a Euparal micromount also pinned beneath the specimen. Although the identity of this specimen might be regarded as being suspect (it being a female), a male from the same rearing identified by Dr. F. Zumpt based upon a genital dissection accompanies it. Comparison of Figures 3 and 4 shows them to be almost identical. Thus it appears that the form of the mandibular sclerite is not diagnostic in separating *W. nuba* and *W. indigens*.



Figures 1–4. Mandibular sclerite of cephalopharyngeal skeleton. 1: *Wohlfahrtia magnifica* (Schiner) ex sheep, Hungary, Sarbagard, viii.1992, vulva wound on sheep, ex 3rd instar larva, det. M. Hall; 2: *Wohlfahrtia* spec. ex Thomson's gazelle, Dubai, ex 3rd instar larva; 3: *Wohlfahrtia nuba* (Wiedemann) ex green turtle egg, Cyprus, ex puparium.; 4 *Wohlfahrtia indigens* ex hopper bait, Saudi Arabia, Burriman, 15.iii.1956, ex puparium.

Wohlfahrtia nuba (Wiedemann, 1830)

Specimens examined: CVRL, 3♂, reared ex maggots developed in cat intestine bait, 25°12'39"N 55°17'15"E, 2005; 1♂, 2♀, reared ex maggots in wound of face of Thomson's gazelle kid (D1649/05) born and kept in Nadd al-Shiba Palace, Dubai, x.2005; CVRL, 3♂, reared ex maggots in open broken toe wound of camel, Nadd al-Shiba Palace, Dubai, xi.2008. At the time at which the sample from cat intestine was collected there was a farm nearby having goats, sheep and cows.

Distribution, biology and hosts: In Arabia *W. nuba* is a common species in Saudi Arabia and occurs also in Yemen and northern Oman. In the UAE *W. nuba* was recorded by Gillett & Gillett (2002) from Merawah Island. Traumatic myiasis caused by this species is most common in camels.

Family Oestridae, subfamily Oestrinae

Cephalopina titillator (Clark, 1816)

Specimens examined: CVRL, 1♂, labelled "Camel nasal bot"; 1♀ and 2 third instar larvae labelled "Camel nose".

Remarks: There have been several cases of *C. titillator* as site findings at necropsy of camels in May and November 2003. All the camels came from the Dubai camel pens next to the old race track at Nadd al-Shiba (25°08'26"N 55°16'39"E). The adult fly was reared from a larva



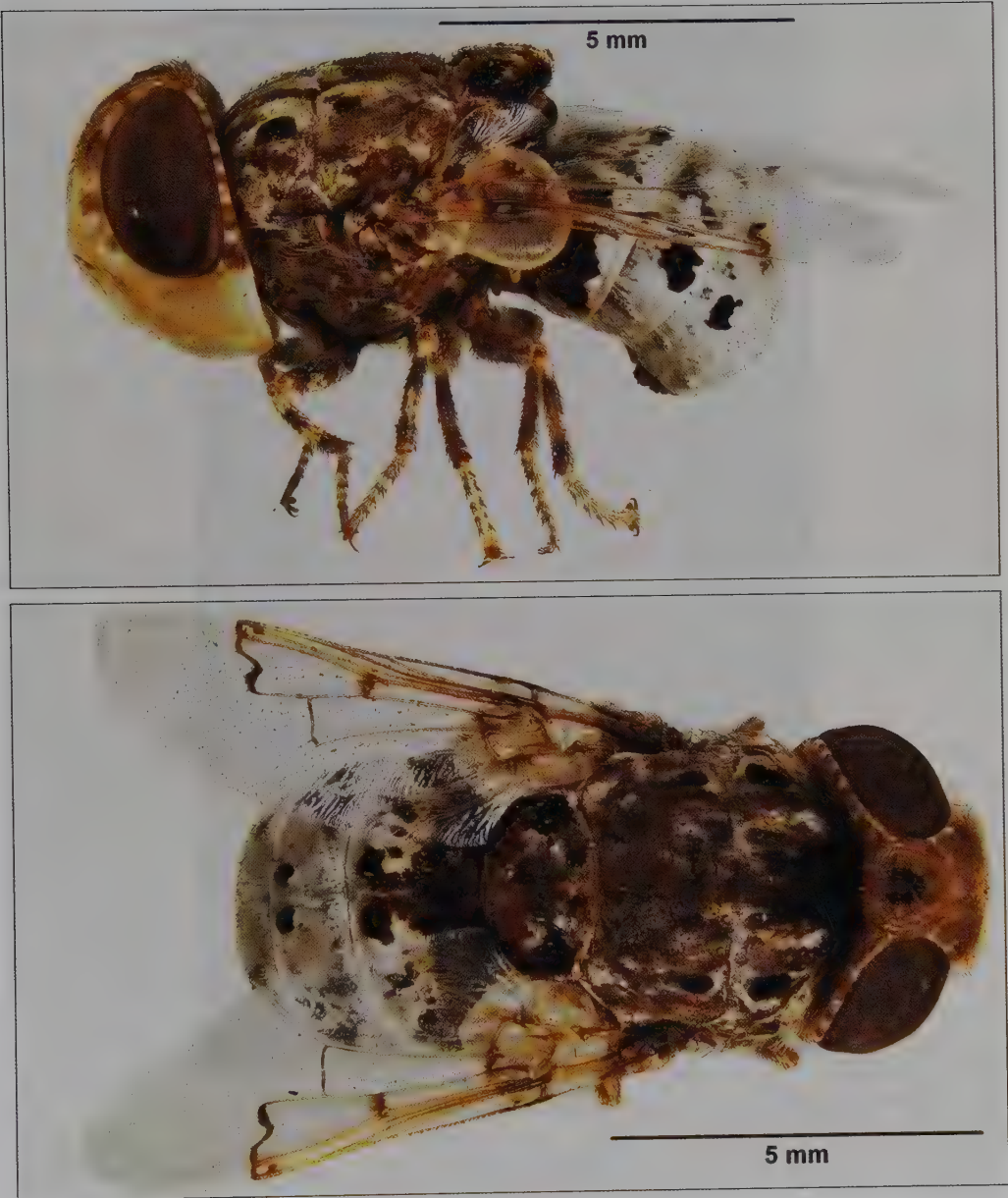
Plates 1–2. *Cephalopina titillator* (Clark), third instar larva from camel nose. 1: Ventral view; 2: Dorsal view. (Photographs © James Turner / NMWC)

placed in sand and is surprisingly small compared to the larva from which it developed. The last time *C. titillator* was seen in Dubai was in March 2007, when the larvae were sneezed out of the nose of a camel in a private camel pen at 25°08'56"N 55°16'39"E. The parasite may have a wider distribution in abandoned camel breeding farms. Racing camels are treated with avermectines, mainly against roundworms and in this age group (2–8 years of age) it might be less frequent. However, the nose and pharyngeal region is seldom opened at necropsy. Distribution, biology and host: Specific to domestic camels, both the Bactrian and the Dromedary, this species may be expected to be found wherever the camel occurs, though there are no records from Australia, where feral camels occur. New to the UAE.

Family **Oestridae**, subfamily **Hypodermatinae**

Crivellia corinnae (Crivelli, 1862)

Specimens examined: CVRL, 2 small (12–13 mm long) third instar larvae labelled “Gazelle”.



Plates 3–4. *Cephalopina titillator* (Clark), habitus. Specimen in Natural History Museum, London (B.M.1939-210, Arabia: Aden, 7.iii.1939, leg. G.H. Henry, det. J.P. Dear). 3: Lateral view; 4: Dorsal view. (Photographs © James Turner / NMWC)

Distribution, biology and hosts: Described from 3rd instar larvae found in skin-boils of a Dorcas gazelle (*Gazella dorcas* (Linnaeus)) imported from Damascus, Syria. Further larvae were found in the same host from the western Sahara. Later it was discovered to infest the



Plate 5. *Crivellia silenus* (Brauer), third instar larva. (Photograph © James Turner / NMWC)

Goitered Gazelle (*Gazella subgutturosa* (Güldenstaedt)) in central Asia. It is also known from Algeria, Kazakhstan and Turkmenistan. New to the UAE.

***Crivellia silenus* (Brauer, 1858)**

Specimens examined: CVRL, 2 third instar larvae (14 and 17 mm long) labelled "Goat subcutan. maggot 1415/8/08".

Distribution, biology and hosts: Goats, sheep and gazelles are recorded hosts. Zumpt (1965: 212, Fig. 314) illustrates the differences in facial dimensions between this species and *C. aegagri* (Brauer, 1863), but Soós & Minár in Soós & Papp (1986) list *aegagri* as a junior synonym of *C. silenus*. Described from adults from Sicily and Mt. Sinai and further recorded

from Crete, Cyprus, Syria, Turkey, Kenya, Somalia, Libya and Central Asia. New to the UAE.

***Strobiloestrus vanzyli* Zumpt, 1961**

Specimens examined: CVRL, 1 second instar larva labelled "Klippspringer" (*Oreotragus oreotragus* (Zimmermann)), which was newly imported and from which it was taken in a necropsis.

Distribution, biology and host: Known only from Zambia, where it was reared from the Lechwe (*Kobus leche* Gray). The single larva resembles that figured by Zumpt (1965: 200, Fig. 297) for this species.

Family Gasterophilidae

***Gasterophilus pecorum* (Fabricius, 1794)**

Specimens examined: BCEAW, Sharjah Desert Park, 4 third instar larvae from feral donkey, 29.vi.2006. CVRL, 2 small (12 mm long) second instar larvae labelled "Donkey". This donkey was 'put down' for welfare reasons in the Hadjar mountains near the city of Hatta in April 2004.

Remarks: There are some six to eight thousand feral donkeys in the UAE, which are considered to be a reservoir for equine parasites. Horses are considered to be more valuable and are given regular veterinary treatment, resulting in few parasites.

Distribution, biology and hosts: Described from Denmark, this species is widespread in Africa, in all but the northern parts of the Palaearctic region and is found also in the Punjab, India. New to the UAE. Hosts include horses, donkeys and Burchell's Zebra (*Equus burchellii* (Gray)).

***Gasterophilus intestinalis* (DeGeer, 1776)**

Specimens examined: CVRL, 1 third instar larva ex feral donkey near to Hatta stud farm. CVRL, 2 second instar larvae undergoing ecdysis plus 1 third instar larva ex horse, Dubai Equine Hospital, 24.v.2009. CVRL, 4 third instar larvae ex pony imported from Holland or Belgium which died in quarantine facility of the Dubai Racing Club, 30.xi.2009. CVRL, 3 third instar larvae ex horse from Jebel Ali, 2003.

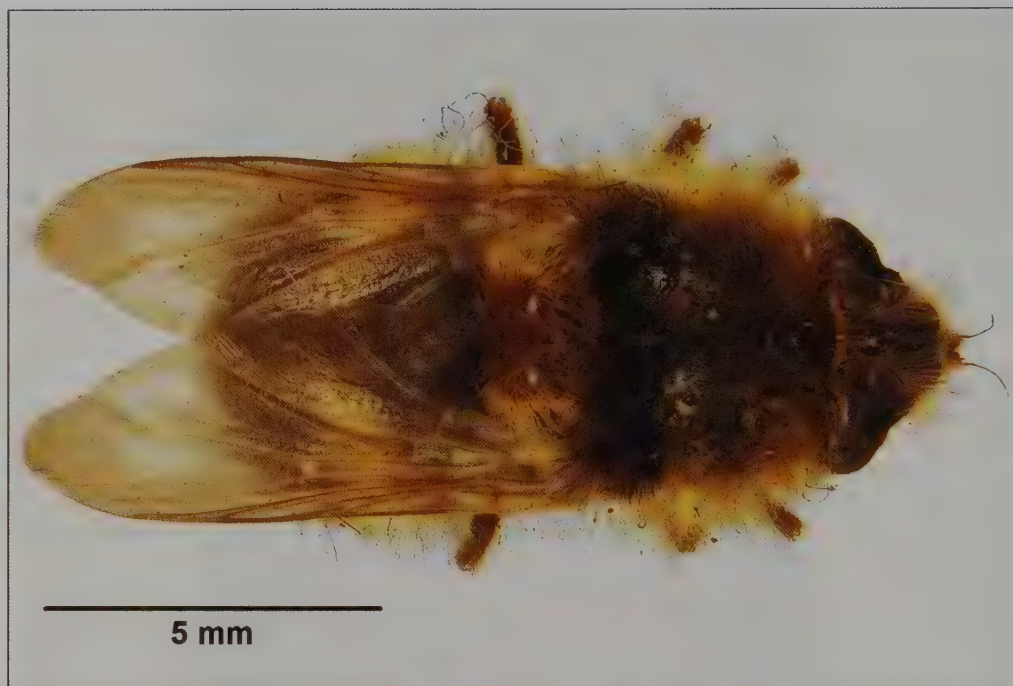
Distribution, biology and hosts: This species, believed to be native to the Palaearctic Region has spread throughout the World wherever its main host, the horse, of which it is a major pest, is found. It also attacks donkeys. Eggs are laid in flight upon the host's hairs, mainly on the fore leg. There they may remain dormant for months and hatch upon the action of the host licking its hair. Once inside the mouth the first instar larvae penetrate the dorsal mucosa of the tongue and burrow within it for at least 24 days. Second instar larvae attach themselves for a few days to the pharynx and sides of the epiglottis before passing to the stomach. This stage lasts five weeks. The third instar larvae are generally found clustering near the boundary of the non-glandular and glandular epithelia. In the stomach larvae are occasionally blood-feeders, but normally feed on tissue exudate. Mature larvae pass out of the gut in the faeces and pupate in the soil. New to the UAE.

Family Hippoboscidae

***Hippobosca equina* Linnaeus, 1758**

Specimens examined: CVRL, 1♀, labelled "Found on a horse imported from France in the quarantine stables" [of the Dubai Racing Club].

Distribution, biology and hosts: A bloodsucking species that attacks mammals, it is widespread in Africa, in the warmer parts of the Palaearctic region and the western parts of the Oriental region. It is as yet unrecorded from the UAE.



Plates 6–7. *Gasterophilus pecorum* (Fabricius), habitus (Specimen in Natural History Museum, London (BMNH(E). 911606, Germany, ex coll. Girschner). (Photographs © James Turner / NMWC)

***Hippobosca longipennis* Fabricius, 1805**

Specimens examined: BCEAW, Sharjah Desert Park, 1♂, 1♀ (the female in the act of larviposition), on wolf, 18.x.2005.

Distribution, biology and hosts: This species is widespread in southern Europe and the Mediterranean, India, China and Africa. In Arabia it has been recorded from central Saudi Arabia and the Batinah coast of Oman, this extending westwards into the Fujairah region of U.A.E. (Walker and Pittaway, 1987, distribution map, p. 110). In Europe it is found feeding mainly on domestic dogs, in Africa on many wild carnivores and occasionally on duiker (*Sylvicapra grimmia* (Linnaeus, 1758)). It does not attack domestic cats. It is an intermediate host for *Dipetalonema dracunculoides* (Cobbold, 1870), a filarial parasite of dogs and hyenas.

***Pseudolynchia canariensis* (Macquart in Webb & Berthelot, 1839)**

Specimens examined: CVRL, 1♂, labelled "Pigeon", originating at the falcon clinic.

Distribution, biology and hosts: As with the parasites of many migratory birds, this species has a wide distribution within the southern part of the Northern Hemisphere. It has been recorded from Saudi Arabia by Büttiker (1980) and from Yemen and the UAE by Deeming (2009b). Although commonly known as the 'pigeon fly', it also parasitizes other bird species.

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Authors' addresses:

Dr. R.K. Schuster, DipEVPC, Central Veterinary Research Laboratory, PO Box 597, Dubai, United Arab Emirates; e-mail: moniezia@zedat.fu-berlin.de

Dr. J.C. Deeming, National Museum of Wales, Cathays Park, Cardiff CF10 3NP, UK; e-mail: John.Deeming@museumwales.ac.uk

Coordinates of localities in the UAE

Abu Dhabi	24°29'N 54°21'E	Marbad	25°20'N 56°09'E
Abu Saluf (Dubai)	25°13'N 55°19'E	Margham	24°55'N 55°38'E
Ajman (N of)	25°26'N 55°29'E	Masafi	25°18'N 56°10'E
al-Ain	24°13'N 55°46'E	Medinat Zayed	23°39'N 53°42'E
al-Ain al-Fayda	24°05'N 55°41'E	Marbad	25°20'N 56°09'E
al-Ajban	24°36'N 55°01'E	al-Muwaiji (al-Ain)	24°12'N 55°42'E
al-Aslab	24°31'N 55°36'E	Nakhalai (Dubai)	25°06'N 55°34'E
al-Awir (Dubai)	25°10'N 55°33'E	Qurraya	25°14'N 56°21'E
Alhala	25°30'N 56°12'E	ar-Rafah	25°43'N 55°51'E
Bithnah	25°11'N 56°14'E	Ras Ghanada	24°49'N 54°44'E
Baynunah	23°39'N 53°37'E	Ra's al-Khaimah	25°48'N 55°57'E
al-Dhahirah (Jazeera)	25°21'N 55°23'E	Ra's al-Khaimah (S of)	25°44'N 55°52'E
ad-Dhaid	25°17'N 55°53'E	Ra's al-Khaimah (Ghaf forest)	25°38'N 55°54'E
Dibba	25°36'N 56°15'E	Rasheed (near ad-Dhaid)	25°17'N 55°53'E
Digdaga	25°38'E 55°54'E	Remah	24°10'N 55°18'E
Dubai	25°10'N 55°19'E	Ruwais	24°05'N 52°38'E
Dubai (Mushrif Park)	25°17'N 55°28'E	al-Samha (NE of Abu Dhabi)	24°40'N 54°45'E
Fagsha	25°10'N 56°11'E	Sharjah	25°21'N 55°24'E
Fujairah	25°08'N 56°21'E	Sharjah Desert Park	25°17'N 55°42'E
al-Ghail	25°24'N 56°04'E	Sweiha	24°28'N 55°19'E
Ghalilah	26°01'N 56°05'E	Sweiha (NARC, near)	24°24'N 55°26'E
Hatta	24°49'N 56°07'E	Tawi al-Faqa	24°38'N 55°31'E
al-Hayer .	24°35'N 55°44'E	Tawi as-Saman	25°14'N 55°49'E
Huwaylat	24°52'N 56°11'E	Tayyibah	25°23'N 56°10'E
al-Jareef (5 km S of Tawayin)	25°32'N 56°04'E	Um al-Quwain	25°32'N 55°32'E
al-Jazirat al Hamra	25°42'N 55°48'E	Um Urage al-Saadi (Adhan)	25°27'N 56°00'E
Jebel Ali	24°59'N 55°01'E	Wadi Asimah	25°24'N 56°06'E
Jebel Dhanna	24°10'N 52°35'E	Wadi Bih (dam)	25°48'N 56°04'E
Jebel Hafit	24°04'N 55°46'E	Wadi al-Ejeili	25°00'N 56°07'E
Jebel Jibir	25°39'N 56°07'E	Wadi Fara (near al-Ghail)	25°26'N 55°05'E
Jebel Mileiha	25°06'N 55°49'E	Wadi Hayl	25°05'N 56°13'E
Jumeira	25°13'N 55°15'E	Wadi Madaq	25°19'N 56°08'E
Khor al-Khwair	25°58'N 56°03'E	Wadi Mirba	25°16'N 56°17'E
Khor Fakkan (dam)	25°21'N 56°19'E	Wadi Safad	25°13'N 56°19'E
Khor Kalba (mangrove)	25°00'N 56°22'E	Wadi Shawkah	25°06'N 56°01'E
Khor Kalba (tunnel)	24°59'N 56°14'E	Wadi Siji	25°10'N 56°01'E
Khor Yfrah	25°31'N 55°35'E	Wadi Tarabat (Jebel Hafit)	24°08'N 55°45'E
Lahbab	25°02'N 55°35'E	Wadi Wurayah	25°24'N 56°17'E
al-Madam	24°55'N 55°46'E	Wadi Wurayah (farm)	25°23'N 56°19'E
Mahafiz	25°12'N 55°44'E	al-Wathba	24°16'N 56°36'E

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nadigi (Stizus)	590
nalandus (Bruchidius)	279
nartshukiana (Oscinella)	793
Nartshukiella	795
Neaetha	27
Nebrioporus	138
negeviana (Metasphenisca)	775
Neogerris	93
Neolophonotus	703
Neoloxotaenia	799
nepos (Carpophilus)	228

niger (Cataglyphis)	458
nigerensis (Arcuator)	786
nigra (Lepisiota)	467
nigrator (Therophilus)	344
nigrescens (Epimadiza)	789
nigrescens (Lepisiota)	467
nigricans (Liris)	546
nigridorsum (Solierella)	586
nigrispina (Bembix)	506
nilotica (Bembix)	506
niloticum (Monomorium)	435
niloticus (Stizus)	590
niloticus (Tachytes)	593
nitidigenis (Oscinella)	793
nitidiventre (Monomorium)	435
Nitidula	230
niveatus (Prionyx)	603
nivifera (Acmaeoderella)	192
noctuabunda (Dasyhelea)	642
nodus (Cataglyphis)	462
nongoniermai (Caryedon)	275
nuba (Wohlfahrtia)	808
nugax (Cerceris)	517
nutans (Halter)	69
nylanderi (Camponotus)	451
Nymphius	251

O

oasium (Camponotus)	451
oasium (Crematogaster)	426
obesus (Brachypogon)	647
obliquum (Anacamptoneurum)	785
obsoletus (Carpophilus)	226
obtus (Agabiformius)	39
occidentale (Chlorion)	599
ocellata (Cyrba)	24
Ochterus	76
octoradiata (Goniurellia)	774
oculata (Bembix)	506
oculata (Neaetha)	27
odiatu (Culicoides)	644
Odinia	780
ohli (Synnevrus)	592
omana (Solenopsis)	443
omanensis (Bezzia)	649
omanensis (Hexatoma)	684
omanicus (Cryptocephalus)	269
Ommatius	726
Omphalothorax	188
opaciventris (Lepisiota)	467
opalipennis (Liris)	546
orientalis (Mangogrostix)	672
orientalis (Paratassa)	194
Orimarga	687
Oryzaephilus	234

Oscinella	793
Oxyapium	789
Oxybelus	557
P	
Pachycondyla	408
Pachylophus	802
paeninsulae (Somalodillo)	47
Palarus	563
pallida (Langona)	25
pallidipennis (Saldula)	98
pallidus (Philanthus)	569
Palpomyia	651
palustris (Saldula)	98
pantherina (Xantheremia)	185
paolorosai (Miscophus)	552
papei (Neolophonotus)	707
papyrus (Miscophus)	557
Paradeudora	203
paramonovi (Turkmenomyia)	751
Parapiagetia	565
Parapsammophila	599
Paratassa	194
Paratrechina	467
Parazodarion	21
Paroscinella	793
parvipunctata (Chrysobothris)	209
parvulus (Neogerris)	93
parysatis (Sphenoptera)	203
patruelis (Lethocerus)	75
paykulli (Plexippus)	27
pecorum (Gasterophilus)	813
Pedilohela	638
Pellenes	27
Pentacora	95
Periscyphis	42
perlucidus (Dendrocerus)	365
perplexum (Monomorium)	435
persica (Ligia)	33
persicus (Dacus)	770
persimilis (Centrophthalmus)	161
peyerimhoffi (Phyllotreta)	256
peyerimhoffi (Psylliodes)	259
pharaonis (Miscophus)	557
Pheidole	438
Philanthinus	568
Philanthus	569
Philotrimium	152
Phlegra	27
phoenicium (Monomorium)	435
phylophorus (Oxybelus)	559
Phyllotreta	256
Picaulia	92
picinus (Chalcoscirtus)	23
pictum (Sceliphron)	603

pictus (Hydaticus)	130
pictus (Hyphydrus)	139
pinda (Anthaxia)	208
pindai (Tituboea)	259
Pison	574
Plagiolepis	467
planiscutellata (Hyalotephritis)	775
Platyarthrus	34
Plenoculus	574
Plexippoides	27
Plexippus	27
Podalonia	599
poecilcnemis (Ammophila)	599
politus (Chloropterus)	269
Polyderis	148
Polyrhachis	472
Porcellio	42
Porcellionides	39
praeclara (Evarcha)	24
praetertissimus (Liris)	546
prepsli (Xantheremia)	185
priesneri (Bembix)	506
priesneri (Tachytes)	593
Prionyx	603
proboscideus (Hippelates)	792
Prodaticus	130
Prokempia	643
Proleptoconops	637
Promachus	707
propodealis (Dendrocerus)	365
Proporcellio	39
Prosopigastrea	580
prosopis (Algarobius)	277
Protodineutus	123
pruinosis (Porcellionides)	39
pruinosis (Sphex)	605
Pselaphia	793
Pseudocastalia	192
Pseudoculicoides	641
pseudojugulum (Saropogon)	710
Pseudolynchia	815
Pseudolynchia canariensis	815
Pseudomicroides	616
pseudonivetcta (Acmaeoderella)	189
psilonota (Forcipomyia)	638
Psylliodes	256
Ptychomus	184
Ptyngidricerus	59
pubiventris (Spermophagus)	277
pulawskii (Eremiasphecium)	536
pulchellum (Sceliphron)	603
pulcherrima (Forcipomyia)	638
pulcherrima (Trupanea)	776
pulchrum (Wadipogon)	739

pumilio (Aetheomorpha)	259
punctatissima (Hypoconera)	408
punctifera (Disophrys)	332
pusillus (Hebrus)	89
pygmaeus (Tachytes)	593

Q

qarahe (Monomorium)	438
quadrisignatus (Harpactus)	542
quadristrigata (Micronecta)	77

R

raddei (Parazodaron)	21
raddianae (Bruchidius)	279
radoszkowskyi (Bembix)	506
Rafalus	27
ragusai (Hypoconera)	408
rectum (Sceliphron)	603
rectus (Trygetus)	16
remyi (Leptoptectus)	154
Rhadinus	742
Rhochmopterum	776
rhodesianus (Ammoplanus)	490
Rhoptrisa	250
riadicus (Adenissus)	115
richardsi (Sulcomesitus)	398
rochei (Bembix)	508
roxana (Anthaxia)	208
ruber (Cataglyphis)	462
rubripes (Ammophila)	599
ruficollis (Hermaphysa)	253
ruficornis (Ctenota)	713
ruficornis (Stizus)	590
rufiventris (Bembix)	508
rufocincta (Cerceris)	517
rufonodis (Ammatomus)	490
rufotestaceus (Messor)	429
rugiferum (Coccygidium)	322
rutilus (Philanthus)	569

S

saadensis (Bembix)	508
Sabroskyina	794
sabulona (Metopostigma)	799
sabulosus (Cataglyphis)	462
sabulosus (Gastrosericus)	538
saharicus (Tachytes)	593
Saldula	98
sanctus (Gastrosericus)	538
sardeus (Anisops)	84
Saropogon	710
saudiarabiensis (Gonomyia)	685
savignyi (Cataglyphis)	462
savignyi (Stizus)	590
Sceliphron	603
Schistopterum	776
schmidgegeri (Sphenoptera)	200

schmiedeknechti (Eremiasphecium)	536
schulthessi (Belomicrus)	495
Scoliophthalmus	784
scovitzii (Sphenoptera)	200
sculpturata (Pheidole)	438
Sebessia	643
semenowi (Chlorion)	599
seminigra (Aetheomorpha)	259
semiramis (Anthaxia)	208
semisphaereus (Dacus)	770
semivittatus (Microeurydemus)	271
senegalensis (Crematogaster)	426
sennaarensis (Pachycondyla)	408
serapis (Tachytes)	593
sericeiventris (Tetramorium)	443
sericeus (Camponotus)	451
sericeus (Miscophus)	557
Serromyia	648
servillianus (Hydaticus)	132
seyun (Evarcha)	24
shuckardi (Cardiocondyla)	424
sicyoidea (Conarete)	668
Sigara	79
Sigmonecta	77
signatellus (Hydroglyphus)	137
signatiffons (Aphthona)	251
silenus (Crivellia)	812
Silvanus	236
simplex (Ammoplanus)	490
simplex (Zodarion)	20
simplicitus (Anaylax)	377
simrothi (Tapinoma)	416
sinaitica (Pheidole)	438
sinuspersicus (Hydroglyphus)	135
siphloidea (Eutropha)	795
Sisyrnodytes	734
skaifei (Bruchidius)	281
socotrae (Rhadinus)	743
Solenopsis	438
Solierella	582
Somalodillo	47
speciosa (Steraspis)	195
spectabilis (Julodis)	172
speculifer (Julodis)	176
Spermophagus	275
sphacelata (Pentacora)	95
Sphaeniscus	776
Sphaerotachys	145
Sphenoptera	195
Sphex	603
Sphyracephala	765
Spilomena	586
Spinthoptera	205
spirifex (Sceliphron)	603

splendidum (Trypoxylon)	610
squamosa (Acmaeoderella)	192
Stator	283
staudingeri (Ctenistes)	158
stellata (Trupanea)	776
Steraspis	195
sternalis (Dasyhelea)	643
stevensoni (Entomognathus)	526
Stichopogon	746
sticticus (Eretes)	130
Stilobezzia	649
Stiphrolamyra	717
Stizoides	586
Stizus	589
stocki (Glareadessus)	132
strakai (Laphyragagus)	543
straminea (Cerceris)	517
Strobiloestrus	813
strouhali (Littorophiloscia)	34
Styringomyia	685
subfasciatus (Liris)	546
subfasciella (Aphanotrigonum)	785
subopacum (Monomorium)	438
substriatula (Parapiagetia)	565
substriatus (Acolastus)	264
sudanensis (Caryedon)	275
sulciferus (Therophilus)	347
Sulcomesitius	394
surinamensis (Oryzaephilus)	236
svobodai (Lampetis)	206
Synnevrus	590
Synoemis	240
Synthyridomyia	639
Syntomus	149
syriacus (Airaphilus)	234
sziladyi (Idiocera)	687
szilalai (Wadipogon)	739
T	
Tachys	148
Tachytes	592
Tachyura	145
Tapinoma	415
tarsicalcarata (Hilara)	759
Technomyrmex	416
tempestivus (Centrophthalmus)	163
tenebrosus (Dichropogon)	741
tenellus (Ommatius)	726
teneriffana (Pheidole)	438
tenuimarginata (Phyllotreta)	256
testaceus (Cremnops)	326
Testergus	256
tetrachaeta (Metasphenisca)	776
Tetramorium	443
tetraphacus (Tachys)	148

Tetraponera	421
Therophilus	337
thomasi (Synoemis)	240
thoracicus (Camponotus)	451
Thyene	28
Thyridomyia	639
tibestiensis (Dasyhelea)	640
tinklyi (Oxybelus)	563
titillator (Cephalopina)	809
Tituboea	259
toxicodendri (Monardia)	680
Trachys	212
Trachysiphonella	794
tranquebarica (Bembix)	508
transispina (Micromya)	680
triangulum (Philanthus)	569
Trichardis	717
trichargyrus (Prionyx)	603
trichopygus (Tachytes)	593
Tricimba	794
tricolorata (Cerceris)	517
tridens (Goniurellia)	774
trifasciatus (Sphaeniscus)	776
tripunctatus (Cybister)	129
Trirogma	484
Trissemus	155
Tropaprionus	677
Tropeopeltis	195
Tropicorixa	80
Trupanea	776
Trygetus	16
Trypoxylon	610
tschoni (Yllenus)	28
tubulata (Trupanea)	777
tumaire (Monomorium)	438
turanica (Parapsammophila)	599
Turkmenomyia	751
tydei (Podalonia)	599
Tylos	34
Tytomyia	63

U

uberatus (Bruchidius)	281
urens (Cataglyphis)	464
Urophorus	228

V

vagans (Cerceris)	517
vagula (Cerceris)	521
Valleriola	99
vanharteni (Acmaeodera)	178
vanharteni (Anthracus)	149
vanharteni (Brachypogon)	647
vanharteni (Euarestella)	774

vanharteni (Macrocoma)	269
vanharteni (Plenoculus)	574
vanharteni (Rhadinus)	746
vanharteni (Somalodillo)	47
vanharteni (Sphenoptera)	195
vanharteni (Sulcomesitius)	394
vanharteni (Trissemus)	157
vanzyl (Strobiloestrus)	813
variegatus (Philanthus)	574
vegrandis (Caepovultus)	109
ventralis (Epicaris)	158
venustus (Ptyngidricerus)	59
verhoeffi (Oxybelus)	563
Vermicorixa	80
vermiculata (Heliocorisa)	79
vernalis (Allarete)	658
vespertilio (Allohelea)	644
vesuviana (Carpomya)	770
viaticoides (Cataglyphis)	464
viduatus (Prionyx)	603
vittata (Cerceris)	521
vittatus (Periscyphis)	42
vittigera (Mesovelgia)	88
vivianae (Dendrocerus)	367
vividula (Paratrechina)	467
vorax (Lamyra)	714
vulneratus (Cybister)	130

W

Wadipogon	738
wahibiense (Monomorium)	438
waltlii (Gastrosericus)	538
Wasmanniella	675
wittmeri (Acolastus)	264
Wohlfahrtia	808
wollastoni (Chaetocnema)	253
wroughtoni (Ceropachys)	410

X

Xantheremia	185
xerxes (Camponotus)	451
Xylopriona	680

Y

yarrowi (Mettrionotus)	394
yemene (Tetramorium)	443
yemenita (Agrilus)	211
Yllenus	28

Z

zarudnii (Macrocoma)	269
zarudnyi (Bubopsis)	63
Zeugodacus	769
Zodarion	20
zonata (Bactrocera)	770
zulficari (Sphaerotachys)	145







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